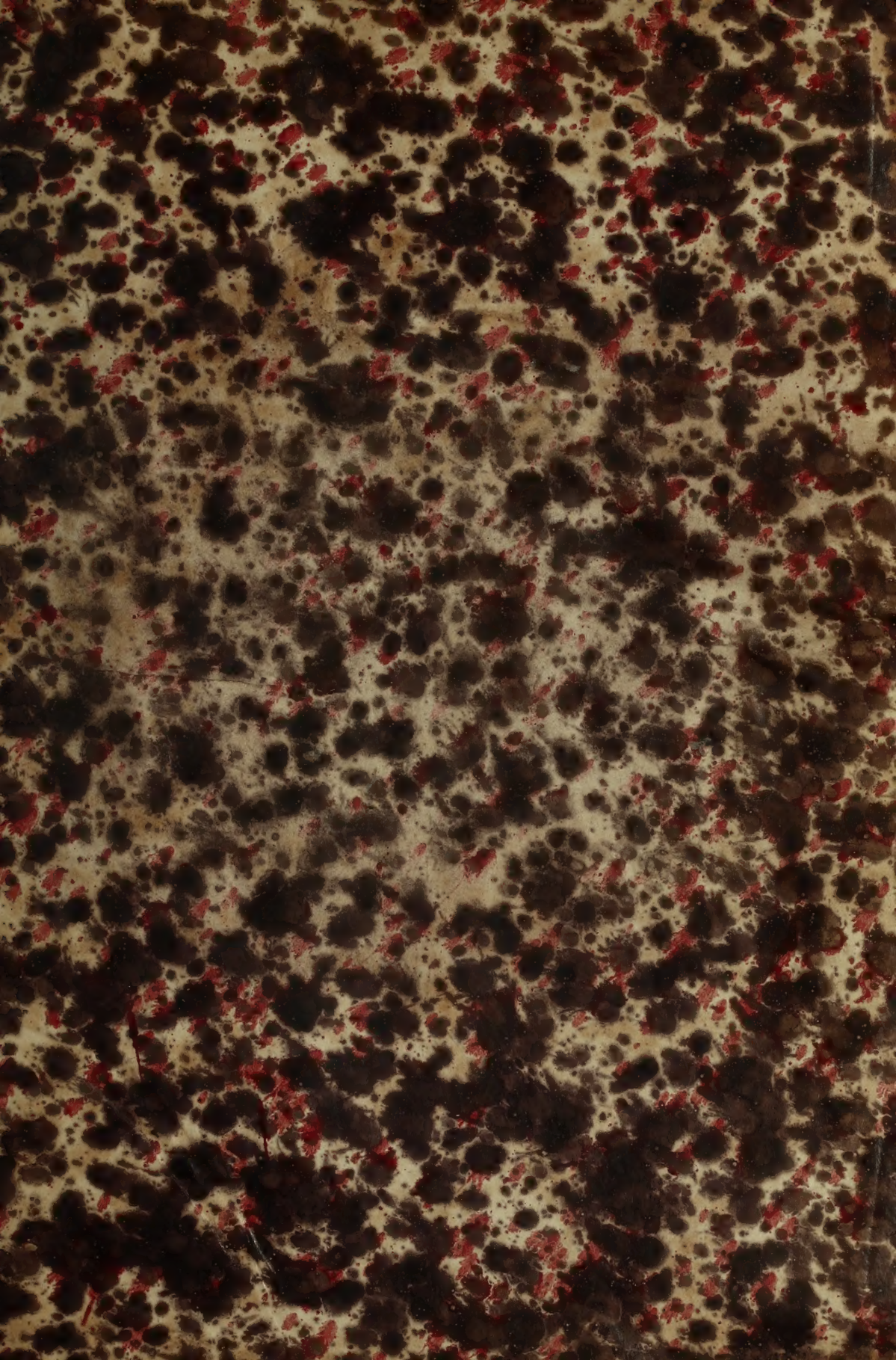




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THE
ARCHITECTURAL REVIEW
AND
AMERICAN
BUILDERS' JOURNAL.

VOL. I.

By SAMUEL SLOAN,
ARCHITECT.

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SLOAN'S ARCHITECTURAL REVIEW AND BUILDERS' JOURNAL.

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PROSPECTUS.

NO Periodical on Architecture and Construction is, or ever has been, issued in the United States. In fact, but one publication of the general scope of our proposed monthly exists in the English language; and that is "The Builder," an illustrated weekly, conducted by George Godwin, F. R. S., the author of "History in Ruins," "London Shadows," etc. This emanates from London, is mainly adapted to the wants of the higher classes of Great Britain, and, as a necessary consequence, is not at all suited to the requirements of America. Yet, this land, though broad, is rapidly filling up; and, as every soul of all its people, male or female, child or adult, either possessing or looking forward to a happy home, is interested in the science and the art of building, and ardently desires the results of the studies of their special professors, we have, after long and mature consideration, determined to do what we can towards satisfying this longing. Should we be at all successful in our design, we shall disseminate feeling and knowledge, which, reacting through the general public upon professional architects, will greatly lighten and improve their future efforts; for none can doubt, that these, whatever their attainments, are constantly impeded in their conceptions by the lack of technical knowledge and appreciation in their patrons. The diffusion of fine general taste produces

thorough artists, or, rather, manifests to the world the utmost capabilities of the gifted.

Accordingly, though our title is circumscribed, our contemplated range is extensive, comprising:

REVIEWS OF THE FINER PUBLIC EDIFICES AND PRIVATE RESIDENCES, erecting throughout the Union—of the Published Plans and Projects of Architects and Engineers; and of Architectural and Kindred Publications.

CIVIL ENGINEERING.

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GENERAL ORNAMENTATION.

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STRENGTH OF MATERIALS:—Stone, Brick, Wood, Iron, Cement, etc.

IRON AND ITS APPLICATION TO BUILDINGS in Fire-proof Construction, etc.

MANAGEMENT OF LUMBER-YARDS, with regard to the Preservation of a full running stock of Good and Well-seasoned Timber, a supply of Hard Ornamental Woods, etc.

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PARKS AND PUBLIC PLEASURE GROUNDS.
ORNAMENTAL TREES.

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AERIAL PERSPECTIVE AND CHIAROSCURO.

THE THEORY OF COLORS.

CHROMATIC EFFECT.

SYMBOLICAL COLORS.

THE NATURE OF PIGMENTS.

THE APPLICATION OF LETTERING AND ILLUMINATION IN OIL COLORS TO INTERIOR DECORATION.

HERALDRY:—As an Adjunct to Architecture, in its History and Ancient Application; as Adapted to the Wants of a Republic, in designing Flags and Banners, the Arms and Seals of States, the Arms and Seals of Cities and Corporations.

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A GAZETTE OF ARCHITECTURAL OPERATIONS:—The Materials to be supplied by the Members of the Profession.

We intend to afford a medium for the interchange of thought and taste throughout the profession, but not for the settlement of disputes. Here, men of culture may commune with one another, upon the general topics belonging to our sphere; but will not be licensed to rail.

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signed. Accepted volunteer designs and articles will have their authors designated, unless they themselves desire otherwise.

Those who wish their articles or designs to appear in type, or engraving, after editorial approval, will be careful to write all proper names very legibly, and all words of the language, decipherable by context, as plainly as may be; to use only one side of the paper; to conform in their drawings to the size indicated by the page of this Prospectus, which is that of the book itself; and to send their names and addresses, not for publication, but for responsibility's sake; as any assumed signatures they please will be printed with their essays. No rejected manuscripts returned.

Our aim is, to cultivate the kindest relations with all members of the engineering and architectural professions throughout the country. Every well-informed architect understands that the diffusion of designs and estimates tends to augment his income. Every intelligent gentleman knows that, while architectural works enlarge his mind and improve his taste, they cannot, when he resolves to build, save him any money; though he may lose much, in cash, comfort and beauty, by not employing practised skill. The individual of fewer opportunities, who is content to follow a published plan, will not consult an architect, until he himself, from unlucky experience, learns that it requires professional knowledge to carry forward either his own or others' ideas to a useful result.

Our production will not be stinted in embellishments. Every part will contain at least four designs, with plans, elevations, details, general descriptions, and close approximate costs, embodying dwellings and stores adapted to town or city, country residences, cottages, villas, mansions, public buildings, halls, chapels, churches, lodges, bridges, monuments, tombs, fountains, summer-

houses, observatories, and pleasure-grounds.

In addition we shall give, as occasion serves, many scraps of information not particularly belonging to any of the above heads, but which the observant will treasure until time shall render them exceedingly opportune.

We wish to call marked attention to one fact, namely: that the body of this Magazine will never be disfigured by advertisements. If any should be given, they will occur on unpagged sheets, for the binder to throw out.

At the same time we shall always be happy to bring to public notice, as news items, with name and address, all desirable inventions, improvements and adaptations, and all superior manufactures belonging either to our general subject or affiliated departments.

The unexpected and gratifying success of the *Model Architect*, put forth by our Mr. Sloan, a number of years ago, and now passing under a second revision,* and the flattering reception of his other books, emboldens us to hope that his superintendence of the present work will be equally well received by a generous public.

Emanating from Philadelphia, already the greatest in geographical extent of

all the cities of America, and destined, at no distant day, to attain and keep general commanding influence, we shall strive to incite her hitherto rather passive, but exceedingly sure business-managers to scan their surroundings, and improve upon whatever of enterprise, taste, or large public-heartedness, they mark among their competitive neighbors.

We shall neither disparage nor underestimate other cities, but encourage and uphold our own. The largest patriotism and liberty spring most surely from the love of home. As a consequence, nothing less than the ever-improving development and entire welfare of the whole nation will content us.

This serial will be first-class in all its accessories, paper, margin, form, type, display, and illustrations. The latter will be mainly on wood, but occasionally in lithography, or chromo-lithography. The size is royal octavo, say eighty double-columned pages per part, about five hundred pages a volume, two volumes to the year.

As we wish to devote all our time to perfecting the contents, the terms are fifty cents per part, or six dollars per year, payable in advance. The First Number will appear between the First and Fifteenth of July next.

All communications or orders will be addressed,

"EDITORS OF SLOAN'S REVIEW,
Second story, No. 152 S. Fourth St.,
Philadelphia, Pa."
PHILADELPHIA, June 29, 1868.

* WORKS BY SAMUEL SLOAN.

THE MODEL ARCHITECT.—A series of original designs for cottages, villas, suburban residences, &c. Accompanied by explanations, specifications, estimates, and elaborate details. Prepared expressly for the use of projectors and artisans throughout the United States. Third edition, with new drawings and large additions. 2 vols. Royal 4to. Many of the illustrations in double-tint lithography. Philadelphia, J. B. Lippincott & Co., 1868.

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SLOAN'S CONSTRUCTIVE ARCHITECTURE.—A guide to the practical builder and mechanic, including choice examples of the five orders; and a number of useful geometrical problems, 65 carefully prepared plates. 1 vol., 4to. pp. of text 147. Philadelphia, J. B. Lippincott & Co., 1859.

SLOAN'S HOMESTEAD ARCHITECTURE, containing forty designs for villas, cottages, and farm-houses, with essays on style, construction, landscape-gardening, furniture, etc., etc. Illustrated with upwards of two hundred engravings. 2d edition. 1 vol., 8vo., pp. 354. Philadelphia, J. B. Lippincott & Co., 1867.

THE GENERAL SUBJECT

IS one which presents itself forcibly and favorably to the imagination, viewed with reference to any region, race, or time. The hoariest eld, the classic eras, the dark ages, the days of chivalry and romance, the dawn of letters, the rise of modern enlightenment, and the present day—the Assyrians, the Copts, the Tyrians, the Hellenes, the

Carthaginians, the Latins, and the Celts—the massive rock-cut temples of India, the flimsy pagodas of China, the colossal fanes, pyramids and tombs of Egypt, the cyclopean remains of the Peloponnesus, the Etruscan relics of Italy, the beautiful vestiges of Greece, the ponderous ruins of Rome, the unhewn altars of the Britons, the round-towers of Ireland; the Byzantine, Saxon, Norman, and Gothic churches; the timber-framed tenements of feudal England, the mounds of North America; the Mexican, Guatemalan and Peruvian terrace-temples; the wigwam of the savage, the fortalice of the Northman, the block-house of the borderer, the hut of the railroad pioneer, the cot of the mechanic, and the palace of the merchant prince—all have immediate connection with the needs and luxuries, the virtues and vices, the pride and worship, the hopes and fears of man; and all, consequently, appeal to every heart.

If dancing is the “poetry of motion,” ARCHITECTURE is the poetry of rest. It has been aptly called “frozen music;” and, as music, in common with all the sciences and arts, is based upon the immutable principles of proportion, we are brought, by however fanciful a road, directly to those severe laws of the higher mathematics, which govern all the satisfactory productions of mankind. Thence spring adaptation and relation; and thence again issue gratification and comfort.

ARCHITECTURE holds, always has held, and ever will, a high place in the literature of the world: and whether in the oriental, or the occidental, the classic or the romantic, the Hebraic or the Evangelic, allusion or insistence are frequent. The palace of Aladdin, fashioned in a single night by the slaves of the lamp; the pile for which David had, his life long, accumulated materials, but which he was not allowed to commence building, because he was a man of blood; the temple of Solomon—whose components, cut at the

quarry, or hewn in the forest, and then fitted and numbered, were brought laboriously, through many months, o’er many miles, from the distant mountains, and finally set up at Jerusalem, without the sound of a hammer—that House of the Lord, upon whose roof of resplendent gold no bird ever lighted; the grand elliptical sweep of the Coliseum, where Roman thousands criticized the voluntary or forced hazard of the gladiators, and gloated upon the martyrdom of the early Christians; the Saviour’s reference to counting the cost of a tower, lest, haply the foundation being laid, the projector should not be able to finish, and so be mocked; His parable of the wise man, who digged deep and built his house upon a rock—these, and myriad other associations, flit before us, or abide as long as there remains a man to utter, or a man to listen.

It must be remembered that the best human structures are prone to injury and decay. The gale, the storm, the tempest, the tornado, and the earthquake, in varying degree, agreeably to climate and to region, effect much. But the unseen or hardly-noticed agents, dryness, moisture, heat, cold, dew, mist, thaw, frost, are the chief sappers. Frost, which cracks and rends the mountains, breaking their solid strata into detached rocks, toppling them down into the valleys, grinding or wasting them into loose soil, must level the mole-hills of mankind. Conformably to purpose, the best is ever the cheapest; the chaste is longest in vogue. The pretentious disappoints, and only the suitable confers happiness. Let us, then, plan sensibly, and build well; satisfying our desires for both ease and beauty, and doing something for posterity as well as ourselves; for, in the lapse of time, all things mundane

“Are melted into air—thin air;—
And like the baseless fabric of a vision,
The cloud-capt towers, the gorgeous palaces,
The solemn temples, the great globe itself,
Yea all which it inherit, shall dissolve,
And, like an insubstantial pageant faded,
Leave not a wreck behind.”

INTRODUCTORY REVIEW.

FOR the instant, we design taking such a hasty glance over the country at large as may be had by the curious traveller after attaining the dominant crest or peak of any particular region. What he gains in prospect he loses in landscape; prospect being an imperceptible gradation from map to bird's-eye view; landscape, the aspect of surroundings from a comparatively low outlook, with air-softened reaches of the distance. Applied to our specialty, prospect is *ensemble* and landscape detail. In these preliminary remarks, we necessarily drop the particular for the general.

In no one attribute is the contrast more marked between the old world and the new, than in the effect of human "improvements"—not always improvement—upon the face of nature or the busy mart. In the trans-Atlantic countries new buildings arise and old ones are felled; but, with few great exceptions, the intelligent traveller may turn and re-turn through the whole of a long life, and not lose his way for lack of the time-honored landmarks. In the cis-Atlantic and north temperate regions, and more particularly inside the domain of the United States, it is perilous to a man's acquaintanceship with his own birthplace, or home of several decades, to leave it for five years. A very curious exemplification of this occurred to the writer, a number of years since, on the New York Central Railroad. At some point on the south side of the track, between Albany and Syracuse, was a new water-and-wood station, apparently about a half mile long. At its eastern end, amid the forest, proceeding westward from Albany, men were levelling the ground, under the direction of a surveyor; a few rods onwards, others were digging foundation holes; a little further, laborers had collected rough stone,

wherewith masons were laying foundations; somewhat beyond, other masons were squaring and proving the hewn stones resting on similar foundations; a short distance ahead, carpenters were framing timbers; farther along, other carpenters were adjusting joists, already framed, to the squared stone bases; onward and ever onward, were others erecting posts and studs, levelling joists, adjusting tie-beams and wall-plates, the ridge-pole and the rafters; others weather-boarding and shingling, and finally a considerable portion of the work at the extreme western end, just finished, resounded with the hiss of a little stationary steam-engine and the ring of a circular saw, reducing the bulk of surrounding cord-wood into food for the locomotive, and flinging it rapidly through an open doorway, probably not in existence the day before, into great heaps alongside the track. Here was a spectacle which, without indulging in even a feather of the wing of the spread-eagle, could have been seen nowhere in the world, except in the United States. For aught we know, after fulfilling its purpose, this wooden structure may have vanished as rapidly as it appeared, and a town of several thousand inhabitants now, at the end of ten years, enliven and adorn the spot.

In passing, we must observe that, considering the abundance, not only of eagles, but of spread-eagles, in continental Europe, it is a little queer that spread-eagleism should all be confined, or at least imputed to the United States. There was the close Roman eagle, perched upon thunder-bolts, careless of peril, in his own mind lineally represented by the close French eagle of the First Empire, perched upon a rock, as on an eyrie, calmly observant of the world, and making a greater spread than any

of his fellows; there are also the spread-eagles of Russia and Austria, both double-headed and both very enterprising in their careers, which they strove not to hide; the spread-eagle of Prussia, with talons scarcely dulled since the seizure of his last prey; and the partly spread-eagle of the second French empire; there is even, in addition, returning to North America, the nearly spread-eagle of Mexico, lodged upon the prickly pear and destroying the serpent; yet, with all these pinions outstretched, or ready to outstretch before an admiring world, the republic of America is supposed to have the greatest flight.

In a short trip along the Ohio and Mississippi Railroad, in 1859, our senior editor saw, throughout the entire distance of about one hundred and seventy-five miles, the waving and flowery verdure of the gently-rolling virgin prairie, apparently as boundless, and really, after the first earnest look, as monotonous as the open ocean. In 1864, he had the curiosity to pass along the same line again. Every section of the lately outspread fertile waste had been taken up for cultivation; fenced houses and hamlets abounded, and towns, peopled by thousands, had sprung up. The reader will understand that, as yet, there was nothing of architecture. The domiciles were of so-called *balloon* structure, framed of ordinary light timbers, covered with inch weather-boards, and shingled. Others, again, were of much ruder make, and guiltless of paint. But it had grown to be a country teeming with men and enterprise. Shafts to the valuable beds of bituminous coal, everywhere underlying the region, were seen in all directions; and the jetty product, in lengthening trains, wound towards Cairo, there to be discharged in bulk into the capacious bunkers of the down-river steamers, or dumped into arks or barges, to be towed along in the wake of steamboats for trip emergencies, while many others were bound in cargo to New

Orleans, to supply the up-river steamers and the smiths of the coasts of Louisiana, Mississippi, Texas, and Mexico.

No more will the Mississippi through-passenger chafe and pace the decks, at his floating palace, being tied up to a tree, to take in wood, about every hundred miles throughout her course, either to the Gulf, or the upper land; no more shall there be any interest, save that of reminiscence, in the song of "Wood up," which, for all living purposes, might now as well be couched in Sanscrit; and no more shall the tall denizens of the forest fall before the axe of the woodman, but rather wait to be the pride of the carpenter or the prey of the hurricane.

The West and the Northwest, characterized by a vast expanse of rolling plain, generate spontaneously a large style of planning and building. The Northwest contains many thousand Norwegians, Swedes and Danes, whose tendencies are greatly for industry and thrift, but whose education, grounded in the narrow scope of Northern Europe, disposes them to operate on a very safe but very narrow scale, reaping with the sickle, and scarcely reaching the scythe and the cradle. There, satisfied with quarter sections of land, if their old accustomed neighbors have quarter sections all around them, and the vicinage is crowded; they carry out the ideas of their Scandinavian fathers. Their children, however, knowing the language and the people better, will not be quite so slow. Yet the houses of all these will be more comfortable and better arranged than the habitations of Americans of much larger estates, because the foreigner builds for comparative permanence and gradual improvement, while the native is content to live a few years in a shanty, in order thereafter better to relish a stately villa upon the same spot. The born American, when settled in the West or Northwest, adds section to section, plants copiously, reaps by the platoon of two-horse machine-reapers, going into the

lands, by fives and tens, like the line of scythemen into the grass swaths, and threshing his grain by a steam-engine, which he fires up upon the lesser portion of the straw, whilst he has to burn the greater to get it out of the way. This largeness of ideas remains with him when he builds. Take the Lake cities, and their more inland river compeers. Detroit has twice as many first-class stores as Philadelphia. Chicago, Milwaukee, Galena, and the other marvellous creations of the West, operate in the same general manner. The State of Minnesota is erecting a public school-house at Winona, to cost from one hundred to one hundred and twenty-five thousand dollars. Its hospital for the Insane at St. Peter's is plain, but very spacious and commodious, and cost about three hundred thousand dollars.

If we take New York, although Auburn, Canandaigua and Coopers-town, have the reputation, in America, of being finished, yet they contain many finished houses and noble piles. Utica, besides the spacious locks and heavy scales of the Erie Canal, the Insane Asylum, and a number of handsome churches, has many chaste and beautiful residences in the upper part of Genesee street, and numerous tasteful and extensive stores on it, in the lower portion, near the Mohawk. Syracuse has much more ambition in all these classes, but it is, generally, not quite so artistic, although comparing well with that of most other places.

The prevailing cast of style for stores and public buildings in the West and Northwest is Palladian, and for churches, Gothic. The earlier crudeness is fast merging in neatness, or even beauty; although, there is still prevalent a destructive waste of means in careless, ill-adjusted, and ugly designs, when the same amount of money, placed at the disposal of a good architect, would have produced edifices of the same room, superior accommodation, greater strength, and absolute elegance. This is the

more deplorable, when it occurs, as it often has, in churches, these being supposed to be the most elegant and stately edifices the vicinage can produce. However, all things considered, the West and Northwest, in most architectural desiderata, are quite in advance of the East and Northeast. They now aim to produce something permanent and good. In New England, where timber is none too abundant, but rock prevalent, and stones are generally so plenty and handy, that they often have fairly to grub, to obtain level space enough to put a house upon, the stones obtained at such cost of time and trouble, from the surface and out of the cellar, added to the other boulders of the farm, are built into field divisions, whilst the house is constructed of timber. In the West they build their houses of stone or brick, and make the fences of timber. Where stone is very plenty, the true construction would be stone outer-wall and brick inner, with a clear space about four inches wide between, to obviate dampness, and apertures through both walls, for the sake of ventilation. Such a house, well plastered, would be very dry and very healthy.

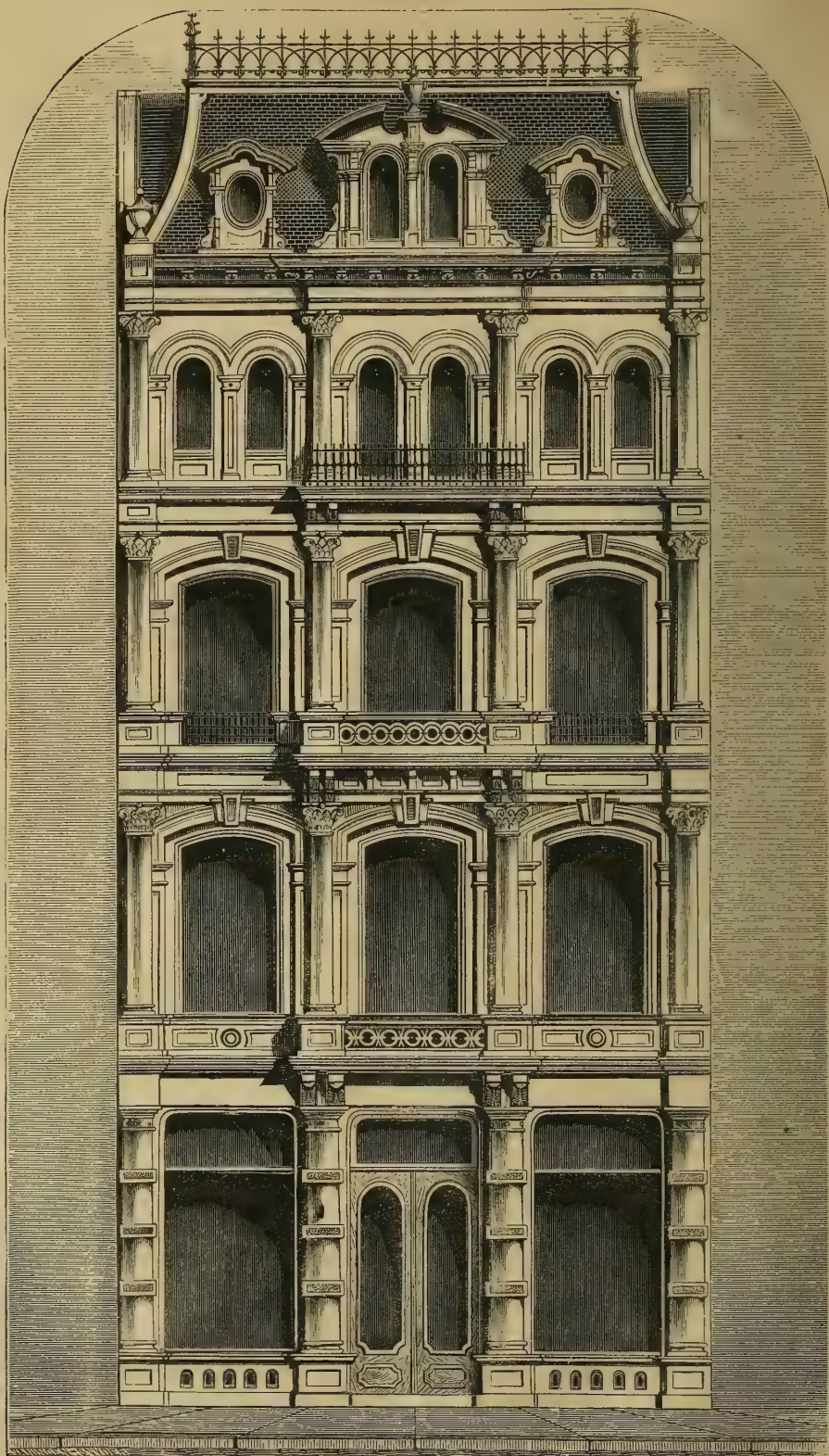
There is in central New York, and parts of the West, a kind of burnt brick, appearing unburnt to those only acquainted with the brick of the Atlantic cities, or of the near interior, and from the color very desirable to introduce, either alone or intermixed, in various patterns, with the ordinary red brick. As a prevalent hue, Indian red is not really disagreeable, neither is it at all agreeable, but may fairly be called indifferent, except as reflecting a very bright sun, when it is simply intolerable. Yet all feel it to be, in sum, the most reliable and durable material, and its rather advancing color is therefore endured. Its common tone is inseparable from the usual proportion of iron contained in clay throughout the world. There are, however, some localities free from the iron, and the clay of

these will produce equable burnt brick of shades varying insensibly from dark cream to full yellow and buff. Utica and Syracuse, New York, have many buildings composed of these warm-tinted bricks. The brickyards near Milwaukee afford them of a fine and even buff color, and they are much used in that city. The conductor of this journal has several times attempted to introduce special patterns of them into Philadelphia, to vary the effect of fronts, in arches and other conspicuous parts; but on each occasion the exigency of hurry prevented waiting, they being in great demand at home, and only obtainable through orders sent long before they are really needed in the proposed building. Something of this sort was formerly known among us in the glazed black-headers, to which perhaps, as used, nobody would care to recur; yet these and those again need not be used in the mere peppering style, but rather be worked in mass to avoid spottiness. A common mode in Paris and its environs is to employ different colors in the bricks of the front; though, notwithstanding, the almost unerring French taste, in a spotty manner. Imagination must always be well reined in, or else she will play us many a scurvy trick. The extreme of this spotted fashion, in the early boyhood of the writer, prevailed in the rural settlements of Pennsylvania, made by the peasantry of the various Germanic nations; and he is told that it lingers yet in the more secluded townships, within from forty to two hundred miles of Philadelphia, mostly in farm-houses, but occasionally in churches. This consists in white-washing the walls and ceiling with the most scrupulous care, then lighting candle or lamp and adjusting the wick expressly for smoking, in order to smoke dots, clouds, and other choicely artistic figures, in quincunx, or other geometrical fashion, in plenteous diffusion all over the original immaculate whiteness.

Among the vicious styles, in our ken,

fast disappearing, we hope forever, is the ambitious; very prone to degenerate into the simulative. We have now mentally before us a domicile, in one of the few very largest cities of the Union, whose elaborately-planned and built Grecian portico, covering the entire elevation of a three-story messuage, is in the side elevation equivalent to four proportional parts out of seven, leaving only three parts for the depth of the house itself. In cost the portico was probably three dollars for every dollar expended on the house itself. This elaborate sham occupies a corner, so that the decidedly overwhelming, though somewhat incongruous effect upon the spectator in front is immediately and most ludicrously upset by a single glance at the flank.

In Montreal there appears a passion for substantiality and chaste beauty. Few cities can surpass, or even equal the store fronts, whose entire two or three stories are, in effect, one glass display-window, while the public buildings, the churches, the theatres, and the grand pier on the St. Lawrence are evidence of uncommon architectural skill and truth. In Quebec we pass to quite another world. The feudal days appear to have revived in the city walls, and the inhabitants apparently are in a constant state of siege from winter. The lofty trans-gothic gables, the steep roofs, covered with bright tin, gleaming in the sun like polished silver; the two long ladders lashed over the ridge of every roof, hinting of possible danger from fire, which must be met on the instant; the vessels careened, when the greatly varying tide is out, on the beach far below the castellated walls; the horses and carts moving around among the vessels on dry shingle, where in a few hours every thing will be again afloat, and the challenge of the sentinels at the various city gates, put the traveller at once in Europe, his impression being confirmed by the solid, secure, but rather heavy or even clumsy, style of domestic architecture.



DESIGN FOR A CITY STORE.

If we turn to the South, we find traces of a semi-barbaric transition. The ideas of room, corresponding to clannish profusion and display, always abounded. If the stairways were wide enough for a coach and horses to ascend, with plenty of space towards the walls, the kitchen fire-place was large enough to contain the whole family seated around the fire. The desire of surpassing, if not of excelling, has always predominated in the South; and this led to gradual improvement in home comforts and enhancement of taste, which were just

beginning to ripen their fruit when checked by the war. Southerners have been known to travel from one thousand to fifteen hundred miles to see a handsome new house. The next thing was to outdo it, at whatever expense, and in this they generally succeeded.

As for ourselves at home, through much delay, and many rude checks, we are gradually attaining taste, beauty, and variety; and this reflection should encourage us to persevere, until all obtain comfort, and all know the canons of art.

THE GAZETTE.

UNDER this heading we design presenting a short abstract of the important new buildings, and their styles, designed, and being constructed, by the various members of the profession, throughout the country. The only cost to them will be the time taken by each in briefly describing his own operations. We sent circulars around to the architects of Philadelphia, simply to start this epitome in our first number; but

probably allowed too short notice. At any rate no memoranda have been sent in. We hope the architects of the United States will enter genially into this project. If what they furnish would tend ultimately to give us official standing, they themselves should certainly experience corresponding benefit. We trust, therefore, that August will find *THE GAZETTE* something more than a name.

DESCRIPTIONS.

ELEVATION FOR A STORE IN THE PALLADIAN STYLE

DESIGN for a store-front of 33 feet in width, four stories high, with Mansard roof, which adds an additional story. Whenever the latter is desirable it can readily be obtained by the introduction of the French roof, now prevalent in almost every section of our country. By this method space is obtained, without elevating the structure beyond its proportional limits; necessarily the case when the building is carried up any farther vertically for that purpose—thus not alone marring the effect of the building, but adding materially to the expense of construction. This does not apply merely to the difference between the cost of these two upper stories. The main cost lies in the additions of

substance needed for strength, from the foundation upwards, to support this additional story, which extra bulk is not needed in the case of the Mansard roof.

There are other advantages gained from the use of the Mansard. In our cities, where the streets are narrow, the sloping roofs begin to spread gradually, conferring greater width or open space for that diffusion of light and air, so essential to the health and comfort of the vicinage. This, of course, only applies to the cities; in the suburban districts, and in the country, it is of little or no consequence, although, in some cases, the introduction arises in pursuance of economy, and in others because it is fashionable. In the former

case, it would necessarily be destitute of ornament. Nevertheless, with judgment and proper care, it may be made to look well, and become an attractive feature. If embellished, the expense is at once considerably increased, and in no case should this be carried beyond what is required to harmonize with the general design. This is too often lost sight of in the introduction of this peculiar style of roof. At times we are almost led to suspect that the architect's ideas did not extend beyond the roof itself. In too many instances the main structure in its design is subordinate to the roof, which is certainly bad composition, betraying lack of taste and judgment.

The design here presented is in the Palladian style; and can be constructed either of stone or cast iron; the former most decidedly preferable. The material should be white marble, and if of iron ought to be painted white.

Each story has on the front a projecting balcony to the centre division. The first and second stories are of the heavy material, as indicated, and the third story wrought-iron railing. The window-guards on the side windows of the third story are of same design and material. All of them should be bronzed, as also the railing on the apex of the roof.

The first story is enclosed with Badger's revolving iron slats. The windows below have large French plate glass, in single lights. The second and third story windows have each four lights, and the fourth story ones two lights. All the sash are double-hung, as also the dormer windows in the French roof.

The wood work of the windows and doors is all of walnut, oiled and unvarnished. The supporting piers in the basement should be granite, if the superstructure is stone; and, if the latter is iron, the piers may be of the same material; but strengthened greatly beyond those above, which may diminish upwards, in proportion as they are relieved of weight. The same principle will

apply to a stone structure. The vault beneath the pavement is covered with granite flags, which span the whole width.

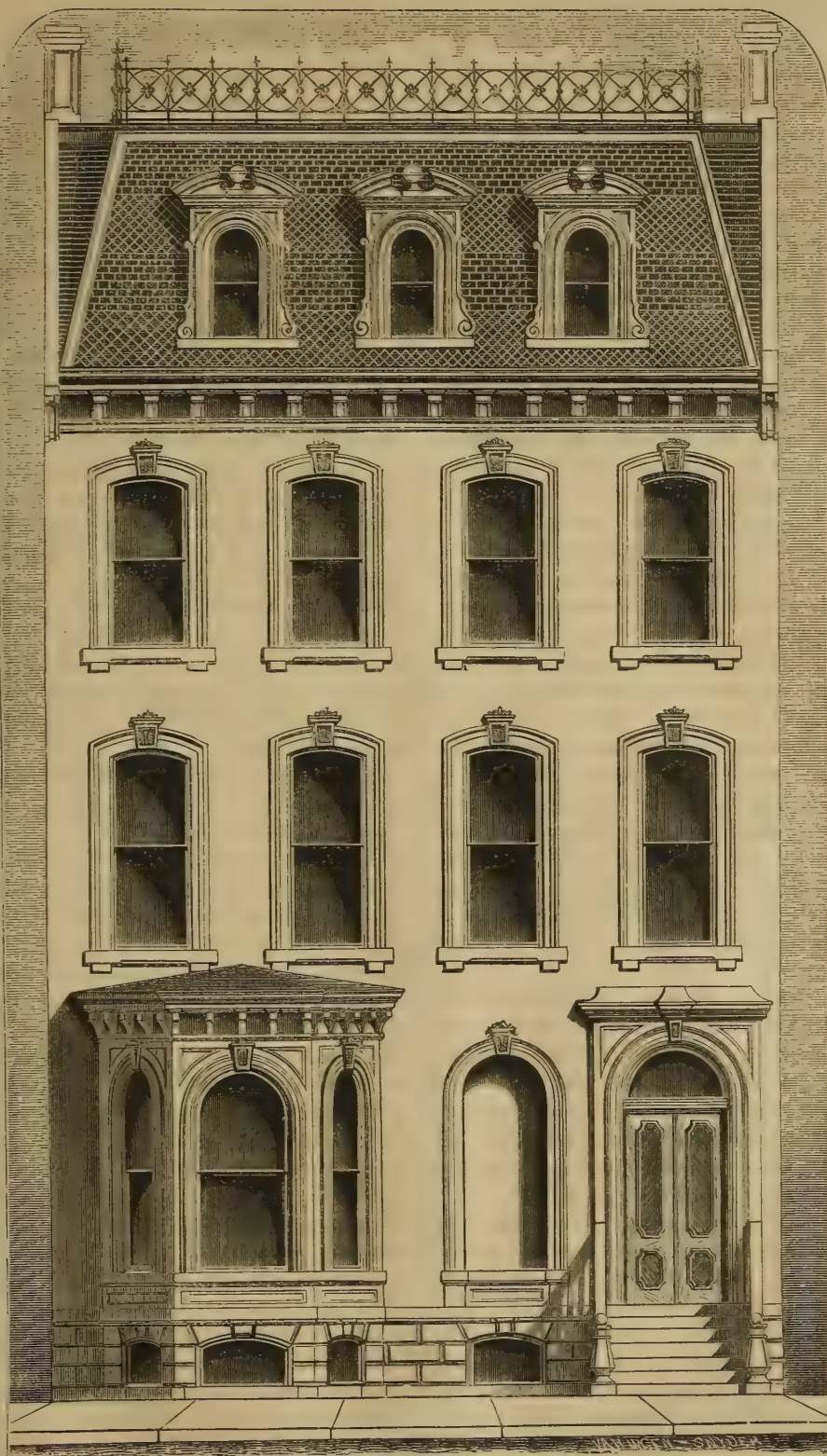
DESIGN FOR A CITY MANSION,

OF which we present a geometrical elevation; and the first and second story plans, which fully show the arrangement of the interior. The third story and attic plans are similar to the second story, except that the latter has baggage-rooms, store-rooms, &c.

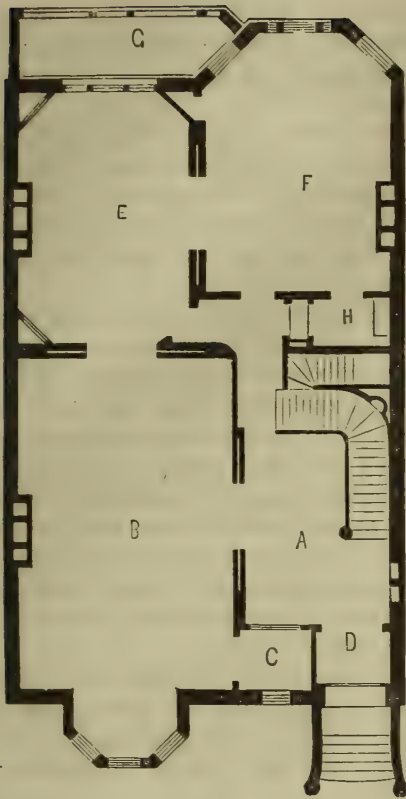
The front is designed for construction in pressed brick, with brown stone dressings; the latter, including the bay window, front door-piece, and steps to same, and the entire ashlar below the line of the first floor, which will all be rusticated. Brown stone facing could be readily adopted in lieu of the brick, at a very small additional expense, and would add materially to the appearance of the building.

The different apartments on the plans may be recognized by reference to the letters on the same.

The first story contains a hall, A, 19 x 13; parlor, with bay window, B, 29 x 18; boudoir, C, 7 x 5; vestibule, D, 6 x 8; library, E, 22 x 16; dining room, F, 22 x 15; an uncovered balcony, G; and a butler's pantry, H, 6 x 12; the latter containing a dumb waiter, butler's sink, and the necessary shelving and drawers, to make a complete arrangement, with the modern improvements. The library has octagonal corners, in which are formed the bookcases; these are continued the whole height of the story, to form a continuous line of cornice around the ceiling, but need not be shelved higher than an ordinary bookcase. The main hall is laid with marquetry flooring of neat design, manufactured in Munich, and imported for that special purpose, with a border to fit exactly the different lines formed by the stairway, &c. The floor of the vestibule is a solid slab of white marble, with hand-



DESIGN FOR A CITY MANSION.



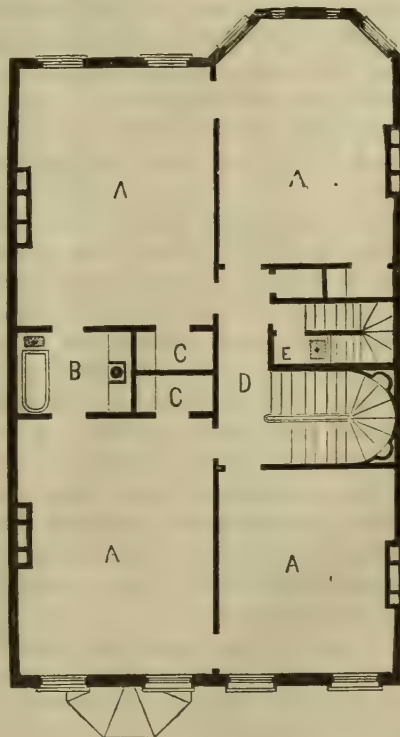
the basement and extending to the second floor, fitted up in the usual way and enclosed with partitions.

The basement story contains the kitchen and laundry apartments, heating apparatus, wine room, provision cellar, coal vaults, &c., all of which are easy of access, well lighted and ventilated by large windows on the front, and an area in the rear; the latter making a full story level with the ground. The kitchen has a pantry somewhat similar to that on the first floor, and is in direct communication with the dining room by means of the dumb waiter and private stairs; the cooking range is large, having all the modern appliances for heating water, &c., and in connection with the circulating boiler, which contains a steady supply for all the apartments using hot water. The laundry is fitted up with stationary wash-tubs, supplied with hot and cold water, and has also a stationary boiler. The heating apparatus is of the most approved

some panels of corresponding material on the sides.

All the apartments on this story are connected, and have sliding doors with circular heads between them, finished in height and style of architrave, to correspond with the windows. The balcony is approached both from the dining room and from the library through French windows, or, in other words, glass doors extending to the floor, and from the library through a French window, or, as aforesaid, a glass door.

The main stairway is made of walnut, extending the whole height of the building from the principal story, with open well-hole and continuous rail, and niches for statuary placed in the walls on first and second stories. The newel at the starting, on first story, is a large octagon shaft, with turned cap and base; the rail is heavily moulded and all of walnut. The private stairs are in the rear of these, starting from



kind, and connects with flues, which have outlets in all the rooms and halls in the upper stories.

The second story contains four chambers, A, two of which are 22 feet by 16 feet 6 inches, one 17 feet 6 inches by 15 feet, and one 20 feet 6 inches by 17 feet 6 inches, the latter with one end octagonal in form. These all communicate, with single doors, and are well provided with closets, C. The latter are fitted up with pin-rails and shelves, and each has a nest of drawers. The dressing-room B is fitted up with a bath-tub, water-closet, and wash-basin, and connects with the large chambers. The tub is lined with tinned-copper, and has a shower over it; the water-closet is of the best pan-pattern, having a copper container; and the wash-basin has a counter-sunk marble top, with china bowl, placed on a wooden stand, and a closet beneath it. All the fixtures for the above are heavily plated, and the supply and waste-pipes are large. The joinery is done in walnut; the front of the tub is neatly panelled and capped; and the side of the room adjoining is neatly wainscoted with narrow boards, tongued and grooved with beaded joints. A water-closet of the above description is also placed in the hall adjoining private stairs.

The front doors in the first story are folding, made of walnut, and placed back far enough from the front line of the building to admit of a wide panel in the stone work forming the door-piece, which has a very fine effect from the street; and the frame has a circular top with plate glass head-light in it. The vestibule doors are similar, except that they have glass panels above the lock-rail, and an archway similar to that of the latter is open beside it, forming an entrance to the boudoir, and a symmetrical finish in the hall.

All the sliding doors are walnut, panelled and heavily moulded on each side, and slide into the partitions on sheaves hung in the head. Those be-

tween the parlor, library, and dining room have embossed glass panels above the lock-rail, and all have bronzed fixtures.

The windows in the front bay have circular heads; and all the others, except in fourth story, are segmental; and all have inside shutters, which for the entire front and all the first story are walnut.

The superstructure is surmounted by a Mansard roof, which forms the fourth story; the outer surface of this is curved and covered with slate variegated in form. The inside walls are furred to a plumb line, which makes the corners of all the rooms square. A loft about three feet high is placed on this story, which protects the rooms from the heat of the sun, and also receives the air from the ventilation flues, for which outlets are provided.

By referring to the plans and elevation accompanying this description, a correct idea of the arrangement and style of the building may be obtained.

DESIGN FOR A SWISS COTTAGE.

THE plan given shows the arrangement of the principal floor, which is placed one story above the ground-floor and approached from the outside by a flight of steps leading to a porch. The principal apartments are all upon the second floor, while the dining-room, kitchen, provision cellars, &c., are on the first. The arrangement of the latter story is somewhat similar to the one above, the halls being the same, and the stairs connecting, as shown upon the plan.

The parlor, A, is 18 x 30 feet, communicating with the sitting-room, B, 15 x 17 feet, by a pair of sliding doors. The hall, C, 10 x 36, contains the principal stairway. This has an open well-hole and continuous rail—starting on the first story with a large newel. The chambers, D, E, F, G, and H, are respectively 14 x 19—15 x 18—11 x 16 and two of



DESIGN FOR A SWISS COTTAGE



8 x 14. These are all provided with open fire-places, and the chamber, E, is octagonal in form, the outer end of which is formed by a bay-window, and the other by adding closets, thus making the room symmetrical. The passage, I, is six feet in width by twenty-five feet in length. The bath-room, J, is 6 x 10, containing the tub with shower over it, a wash-basin and water-closet. L is a balcony, supported by brackets, and approached from the parlor by windows extending to the floor. The sitting-room is supported on posts forming an arcade under it, and connecting with the dining-room.

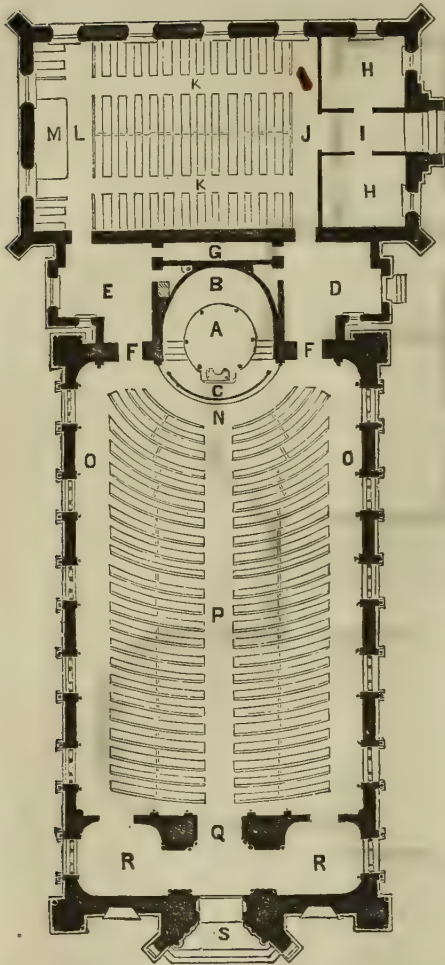
The exterior of the building is considerably broken in outline, having gabled roofs with wide projecting eaves,

and an observatory on the top. The porch, K, is covered by a continuation of the main roof, and forms the principal entrance to the house.

The material used in construction should be stone, and the roof covered with slate, cut in variegated patterns.

THE MEMORIAL CHURCH
AT GETTYSBURG, PA.,
WITH ADJOINING CHAPEL.

IN the subjoined cut we present the design for the proposed Memorial Church about to be erected at Gettysburg, Pa., with the Chapel in the rear, to be used for vestry purposes. The main body of the building, composing the Memorial or Monumental Church, is 50



feet in width by 100 feet in depth—with a tower and spire in the centre of the front one hundred and sixty feet in height—and all designed to be constructed of stone. The chapel is not intended to form a part of the Memorial Church, but will be erected simply for lecture, school and kindred purposes.

The building should be constructed with light-colored granite; and the design will be carried out in the most artistic manner.

The tablets on the exterior are within panels formed along the sides and front of the building. The sides have a continuous line of small columns, with arches springing from the caps, forming a tablet-panel and window alternately.

The bases of these columns are placed on a line with the window-sills and supported by gabled buttresses, which have panels between them, thus making two rows of tablets in height along each flank. The four angles of the building are finished with tableted monumental buttresses, containing open tabernacles, surmounted by pinnacles. These are designed to represent, by device, the four points of our great continent.

The interior will be arranged, on the sides, somewhat similar to the exterior, with columns and alternate windows and tablets, the angles of the audience room containing tabernacles and the ends tablets, enclosed within columns and arches. The vestibule will also be conspicuous in its array of tablets, and have handsome arches supported by the columns formed on the angles of the piers supporting the tower. The interior wall will be stone, and the floor throughout will be laid with encaustic tiles, or marble. The apse in the rear of the pulpit is circular in form, and designed with a view of containing a picture commemorative of the Battle of Gettysburg, or, if more ecclesiastical, a historical account of the great memorial enterprise undertaken and executed by persons interested, throughout the country. This is lighted from above; and behind the screen in the rear of the sanctuary the lights are concealed from the congregation; and so arranged as to distribute the rays uniformly upon the whole surface of the circular wall.

The tablets before mentioned comprise only a small portion of the whole number that are placed at various points throughout the building, but are the principal ones; and our limited space will not permit a more detailed explanation. An inspection of the cuts presented with the foregoing description will give a complete and correct view of the edifice as it will be erected.

In a future number, we will give an interior view of this church, with a full description.



MEMORIAL CHURCH AT GETTYSBURG, PA., WITH ADJOINING CHAPEL.

TO OUR PATRONS.

From the many little but time-eating drawbacks attendant upon an entirely new enterprise, the essays of this number collectively have more of a general style of treatment and local application than we design to be characteristic of the work. Hereafter, probably, the editors will expatiate less and impart more.

We congratulate our readers upon the acquisition of Messrs. HENKELS, GIBSON and LEEDS as contributors upon their respective specialties, the Nature of Woods, Stained Glass, and Ventilation, as evidenced by their preliminary articles, which appear in this number; and have the pleasure of stating that these eminently practical gentlemen will develop each his respective subject from month to month.

THE PHILADELPHIA GAS TRUST.

We have no terms of reprehension severe enough for the misconduct of the Trustees of the City Gas Works in depriving seven-eighths of the city last evening, of that prime necessity—that chief protection of enlightened society—gas-light. Had it been in New York, where the privilege of lighting is farmed out by the city to different companies, none of whose gas is quite equal to our own, a single district only would have suffered. Here only the portion supplied by the Northern Liberties Gas Works escaped. The absence of most of the Trustees is not an exoneration. Those who assume a responsibility must fulfil its duties, or expect to hear, in hardly measured terms, of their delinquencies. If these gentlemen cannot find sufficient time for both duty and pleasure, and prefer the latter, resignation is open to them and would be an honorable course. If they take neither horn of the dilemma, the community will look after them in good time. A great municipality has a right to expect regular and efficient service; and cannot

readily find a substitute for gas, after using it for a quarter of a century. The stores of dealers in lamps, oil and fluids, candles, and candlesticks were emptied almost immediately, last evening, yet there was no light. It is not the inconvenience of the loss of hours or days, however galling, that we here advert to, though this would be ample provocation for much more than we have said; but the impressive fact that in a crowded community of nearly a million, the absence of accustomed light means the presence of theft, burglary, arson, assault, outrage, murder, and every thing perilous and vile.

PHILADELPHIA, *Saturday, July 18th, 1868.*

STEEL IN SWEDEN.—An examination of the specimens of Bessemer steel from Sweden in the Exposition shows us that the metal there produced is of a far superior character to that made in England, and naturally leads to inquiry as to the cause of the difference, and whether we may hope to attain the same success in the United States. First we observe coils of wire of all sizes, down to the very finest, such as No. 47, or even smaller. This they have not been able regularly to produce in England. In the next place we notice a good display of fine cutlery, and this metal answers so well for this purpose that it is now used almost to the exclusion of any other. This statement is corroborated by the fact that in the miscellaneous classes of the Swedish department, where cutlery occurs not as an exhibition of steel, but merely as a display of workmanship by other parties in the same manner as other articles of merchandise, cases of razors are exhibited with the mark of the kind of steel of which they are made stamped or etched upon them as usual, and these are all "Bessemer," but from a variety of different works. The ore used in Sweden for producing iron for the Bessemer process is exclusively magnetic, and of a very pure quality.

THE PENN TREATY-GROUND AND A MONUMENT TO WILLIAM PENN.

THE PURPOSE.

SHACKAMAXON, *the place of the Neels*, or Sakamaxon, *the place of the chiefs*—either, or both, included in the old actual district, and present courtesy one, of Kensington, Philadelphia—possesses a hallowed spot, long since devoted, in the popular wish, to the site of A PUBLIC SQUARE AND FREE LANDING, to be graced, at the earliest practicable moment, with a lofty monumental pillar, consecrated to the pure memory of the Founder of the Commonwealth of Pennsylvania, WILLIAM PENN.

The matter was brought before the County Board by Thomas S. Fernon, Esq., in 1848, though ineffectually. A sum of money was appropriated; but the scheme failed. Not long afterwards, the same gentleman, then an Assemblyman, originated a clause in a bill, which passed the Legislature early in 1852, quoted as follows, in the *Philadelphia Ledger*, April 15, 1852:

THE TREATY-GROUND.

"In order to dedicate to public use
"and embellishment the site of William
"Penn's Treaty held with the Indian
"nations in the year 1682, under the
"Elm Tree, in Shackamaxon, now Ken-
"sington; Beach street, in the district
"of Kensington, county of Philadel-
"phia, shall be widened from its present
"southernmost line one hundred and
"fifty feet, beginning on the line of
"Hanover street, and thence extending
"eastwardly, parallel with the line of
"said Beech street, at least one hundred
"and fifty feet, so that the area to be
"dedicated to public use shall be two
"hundred feet between the lines of Beach
"street, and two hundred feet eastwardly
"from the western line of Hanover street;
"said street to be opened, as soon as
"practicable, to the width herein pre-

"scribed, as streets and roads are opened
"under existing laws, in the city and
"county of Philadelphia; and the Com-
"missioners of the district of Kensing-
"ton shall have the power to enclose a
"plot in the centre of said area, not
"exceeding one hundred feet square, and
"shall place, or authorize to be placed
"therein, a monument, or other memo-
"rial, to commemorate an event iden-
"tified with the settlement and history of
"the Commonwealth."

This would make a plot of 100 feet square, with streets 50 feet wide, entirely surrounding it. The most casual glance at the map herewith presented will show that this provision does not even include the site of the Great Elm, which it leaves almost in the midst of the eastern contemplated street; and the monument representing it, if placed in the middle of the plot, no nearer the actual site of the Elm Tree, although in a rather different direction, than the present one. What the writer proposes, is a public square and a free landing forever, to comprise all the space between Richmond, Palmer, and Marlborough streets and the Delaware river, with three main winding paths representing the old River road, Hanover street, and Allen street, that pedestrians may not have to travel out of their way—with Delaware avenue open through it, but with the pier always open to the river, and well provided in landing-slips, and posts, with elegant water-gates, a tasteful summer-house on the site of Fairman's Mansion, and a towering monument to William Penn, centred in the very centre of the GREAT ELM TREE, as specially marked on the plan. This should be so designed as to have ample room for the display and preservation of a marble statue to Penn and full commemorative

tablets. Trees might be planted on the borders of the pier; and should be, of course, throughout the square, among which elm of the species of the treaty tree should be foremost. Every thing connected with this memorial pleasure-ground should be of the most elegant description. Pennsylvania cannot be too profuse in honor of her Founder. With organization and concert of action a very trifling sum from each inhabitant of the City and the State would provide ample means for this imperative demand of public gratitude and esteem for the wisdom and the virtue of our founder, WILLIAM PENN.

The reader will please bear in mind that the accompanying maps—prepared with great care from data, furnished by Jonathan Eggleton, Esq., Draughtsman in the Registry Bureau of the City Surveyor's Office—present the old measurably natural shore lines, and not the artificial additions made to reach the Port Wardens' line, which is from 300 to 500 feet further out in the river, there being now about as much made ground beyond the shore line of the special treaty plot, as the width of the tract depicted in the larger scaled map, or nearly 400 feet.

THE PLACE.

Shackamaxon, *the place of the eels*, which may have been corrupted, both by territorial and euphonic proximity, from Sakimaxing, *the place of the chiefs*,*—a tract, or tracts, now known as the Sixteenth, Seventeenth, Eighteenth, and

* Mr. Heckewelder says: "*Shackamaxon* signifies '*the place of the eels*,' from *Schachamek*, the Indian name of that kind of fish." Ancient records, not seen by Mr. Heckewelder, give it *Sackamezing*, or *Sachemexing*. This makes an important difference. *Sakima* (our *Sachem*) means, in the Delaware language, a *king*, or *chief*; *ing*, the Indian termination, indicating locality, or *the place where*. Thus, *Sackamezing* may naturally be explained as "*the place*" where the chiefs meet or resort. The "*x*" is for euphony; euphonic consonants being very common in the Indian tongues.—DU PONCEAU. Singular that the Indians should be in this particular as fastidious as the modern French. Watson, in his *Annals*, remarks that Edward Duffield told his son he had heard Shackamaxon meant *the field of blood*, from a great Indian battle once

part of the Nineteenth wards, Kensington, Philadelphia,—is world-renowned for the Great Treaty with the Indian nations made, in 1682, by William Penn. As just noted, philologists differ, not about the etymology, but the name of this celebrated locality. Here is a curious point. The Hon. Henry D. Gilpin, in 1857, replying to Granville John Penn, Esq., who had the moment before presented the Historical Society of Pennsylvania with the veritable belt of wampum, passed from the savages to Penn, in ratification of the Treaty, uttered a pertinent sentiment, here very slightly amplified: "A treaty not authenticated by" [any known] "contemporary written record * * * still rests, after more than one hundred and seventy years, on an unbroken and unvarying tradition," [among both the red men and the white,] "but the incidents in relation to it, which have, from time to time, been successively developed," [always] "verify and never contradict it." So the theory of the writer, with respect to these two names. Both are, with extreme probability, correct. Shackamaxon was, incontestibly, the name of a considerable district, much larger than that represented by Sakimaxing. Judge Richard Peters tells us, that the Delaware in this general neighborhood washed a sandy beach. The writer knows, and it is within the memory of many citizens of Philadelphia, that a fine beach of sand and pebbles† stretched along the present Richmond front, and far above towards Point-no-Point. This will not apply to "the place of the eels." But Cohocksink creek ran, as it now runs, from its source, about a mile due east of South Laurel Hill, in a general southeasterly direction, to where it meets the tide, say near Second and Laurel streets. Below this,

fought there; and further that the Delaware Missionary Lukeubach said it was a Delaware word, allowing for a little variation in spelling, signifying, a *child not able to take care of itself*. But both of these etymologies are more than doubtful.—ED.

† A great resort of boyhood in quest of jack-stones.

in the water's recollection. It wandered in a very tortuous and eel-like manner, through extensive mud-flats, from the ground there forming an oblong basin about a mile in length, and varying in width from ten or twelve hundred feet near the river, to from one to two hundred feet at the head of tide. These were originally much more extensive, occupying all the side of a dyked meadow at the junction of the two branches of the Cohocksink, about where Frankford road, Laurel and Maiden streets come together, a considerable distance along the main branch of the Cohocksink on the north side, and both sides of the smaller branch, reaching as far up as the present Jefferson street. This stream is now nearly all culverted. Its open head, a trifling rill, can yet be seen by the curious crossing York street, above Second, and running in the same general direction with the latter. This marsh, then, it will be seen, ran far up behind the treaty-ground, and was in its lower spread distant from it not more than thirteen hundred feet. This was, assuredly, "the place of the eels," a black, unctuous, slimy spot, important enough, in aboriginal estimation, to characterize the entire neighborhood. Mr. Jonathan Eggleton, who, in his youth, has often gunned for birds along the banks of the smaller fork, and in his boyhood, some fifty years ago, has often waded the fen or swum the stream, according to the state of tide—informs me that it was then a very great place for eels. With the exception of about eleven hundred feet of very foul open water, from a little above Maiden street bridge* to the Delaware, this is all culverted, and thus hidden from the public view, beneath the crooked line of Canal street. But higher up the Delaware, by three-eighths of a mile, than the mouth of the Cohocksink, and nearly the same distance due east of this ancient morass, was, according to Judge Peters, the

ample space and elevated shore of what had of old been a favorite Indian village. Undoubtedly, then, this was Sakimaring, "the place of the chiefs." But, curiously enough, J. F. Watson tells us that "There was once a place of low boggy marsh, into which high tides flowed [from the Delaware,] now all filled up, about one square westward of [down river from] the Treaty Tree." In other words between the site of the Tree or Council Bank and Battery Hill. This would be another place of the eels.

Thus, again, two apparently irreconcilable things are reconciled. The early whitesettlers, doubtless, soon confounded names to them so very similar, and applied the ignobler term to both localities. But *the place of the eels*, symbolically, would not be an ignoble term. The rule in allegory, in general pictorial symbolism, and in heraldry, is to read characteristic attributes in the better sense. Thus, without any designating adjuncts, the serpent and the fox would typify wisdom; the wolf, perseverance; the dog, fidelity; the cat, wariness; the lion, courage, &c. In this acceptation, the eel would denote adroitness, and be equally typical of the cool hankering of the Sagamores for the white man's comforts and conveniences, and of the guarded desire of the Proprietary for Indian land-titles and good neighborhood. In this view, *the place of the chiefs* would also be *the place of the eels*.

Peter Cock had from the Governor of New York, in 1664, a grant of a tract of land called Shackamaxon.—WATSON.

Under the New York colony government of the Duke of York, the affairs of the Pennsylvania settlements were administered by a deputy of the governor called the "Commander." There was a meeting, March 13th, 1676-7, of Captain John Collier, Commander; Justices, John Moll, Peter Cock, [probably father of "Lasse, Lawrence, or Lacy Cock,"] Peter Rambo, [whose lineal descendant of the same name was among us the last generation, and may be coming up again

* Known to all Kensington as "The Stone Bridge."

amongst children too young to appear in the directory,] Israel Helm, Lace Andries, and Otto Ernest Cock, which resolved that "Captain Collier and Justice Israel Helm go up from Upland, or Chester. [then the metropolis (!)] to Sachamexin, (whereat at present a great number of Simico and other Indians are,) and persuade the Simicos, the Susquehannas, and these river Indians [*i. e.*, the Delawares] to send each a Sachomore, or Deputy, to his Honor the Governor at New York, to confer with him about their demands."—DU PONCEAU. FISHER.

Long before 1682, in 1677, and later, a settlement at Shackamaxon had been formed by natives and by some Europeans from the colony of West Jersey.—ROBERTS VAUX.

"Shackamaxon was an ancient Indian town. John Kinsey, one of the commissioners sent to organize the government of West Jersey, died there, in 1677, soon after he landed."—VAUX.

"In 1678, Lawrence Cock acknowledged, in open Court, a deed by which he conveyed to Elizabeth Kinsey 300 acres of land in Shackamaxon."—DU PONCEAU. FISHER.

This Elizabeth Kinsey was probably the widow of the John just mentioned.

Judge Peters, whose recollection dated back to 1760, wrote to Roberts Vaux, Esq., that "this Indian settlement, then deserted, was familiar to and esteemed by the natives." Extant documents tend forcibly to prove that this was, and had been for generations, the great place of resort for the aborigines, not only of different tribes, but of different races, thus adding greatly to the importance of the locality. At or near it were council-fire and burial-ground, the latter especially holy in Indian eyes. It was presumably the savages' treaty-ground, although a little prior to Penn's coming amongst them, their chief village, a very large one, was Cooper's Point, New Jersey, immediately opposite, across the river Dela-

ware. This adds exceedingly to the sacredness of the spot.

THE TREE.

In the immemorial times, it had been occupied by a noble grove of ancient lofty trees, prominent among them the stately buttonwood, exceptionally graceful in foliage, while picturesque in stem, and the statlier, full-pleached, overarching elm. Probably not the oldest, or the largest, but finest and foremost of these, in Penn's day, was

THE GREAT ELM;

distinguished among the forest giants, as men are distinguished among their fellows, by proportion, symmetry, and adaptation; preponderant, as, in all respects, the best. "It stood," says Judge Peters, "upon a high, clean bank, with a fine area around it." Beneath the branches of this tree, gathered, on one side, the Indian Sachems, on the other, William Penn and a few influential friends, there to make "the Treaty, not confirmed with an oath, and never broken." "It stood opposite the house in which President Palmer resided in olden times," namely, the Fairman Mansion, which was constructed in 1702.* for the use of Thomas Fairman, the Deputy of Thomas Holmes, the Surveyor General. It was taken down April 18, 1825. William Penn himself had wanted it. Governor Evans, after his term of office, lived there. Afterwards, Governor Palmer. Subsequently to Palmer, Mr. Thomas Hopkins occupied it for fifty years. In the same letter in which he desired to know whether this mansion could be had, William Penn mentioned he would remain permanently in Pennsylvania if the Assembly of the Province would give him £600 per annum salary, as Governor. Among the early stated and official appointments for Quaker Meetings was one at Thomas

* The house probably stood on the ground afterwards occupied by the mansion. This will account for the apparent discrepancy of the date 1702.—Ed.

Fairman's, 11th of 2d month, 1682. This was before the treaty. Robert Fairman, of London, in a letter of 1711, speaks of the house at the 'Treaty Tree.'—WATSON.

The eccentric but truthful Benjamin Lay, who came to Pennsylvania in 1731, aged fifty-four, within less than fifty years of the Treaty, always assured Judge Richard Peters, David H. Conyngnam, and their boy companions, that the great Elm was the identical Treaty-tree. He probably was acquainted with individuals who knew the fact. It lived in vigorous health until March 3d, 1810, when it was blown down by a violent storm. "The blow was not deemed generally prevalent, or strong. In its case the root was wrenched and the trunk broken off. It fell on Saturday night, and on Sunday morning hundreds of people visited it. In its form it was remarkably wide-spread, but not lofty; its main branch inclining towards the river, measured one hundred and fifty feet in length. The tree, such as it was in 1808, was very accurately drawn, upon the spot by Thomas Birch; and the large engraving, executed, after Birch, by Seymour, gives the true appearance of every visible limb. Whilst it stood, the Methodists and Baptists often held their summer meetings under its shade. The fallen tree finely revived, in a sucker of it, on the premises of the Pennsylvania Hospital on the vacant lot, exactly in the middle of the present Linden street. It stood a while in the paved street, and was cut down in 1841. It had been placed there by Messrs. Coates and Brown, managers. There was another sucker growing on the original spot, amid the lumber of the shipyard, a dozen years ago. It was then fifteen feet high, and might have been larger but for neglect and abuse. I was about taking measures to protect it, when I ascertained it to be hopelessly injured."—JOHN F. Watson.*

After the tree was uprooted, the trunk measured twenty-four (24) feet in circumference, or eight (8) feet diameter; and by counting the annual growth, its age was ascertained to be two hundred and eighty-three (283) years, having been one hundred and fifty-five (155) years old at the time of the treaty. The Indians are not recorded as ever reverting to this tree in their reminiscences, and this has been seized upon as unsettling the credence of common report, on account of their addiction in their speeches to local association; but the traditions of the whites concerning the great Elm of Shackamaxon, as the Treaty-tree, has been continuous, uniform, and persistent. The Indians did not mention either Treaty-ground or Treaty-tree, probably on account of the extreme unusuality of the Treaty itself; and the perfect satisfactoriness of its fulfilment, upon the part of Penn and the two following generations of proprietary administrations, needing no aid from extraneous natural objects, or oratorical accessories.

Benjamin West, the painter, however, (see below,) says: "This tree was held in the highest veneration by the original inhabitants of my native country, the first settlers, and their descendants." West's own grandfather was a participant, one of the five dignified individuals present with William Penn in the solemnities of the Treaty. In his picture of the Treaty, the painter has given a likeness of his ancestor in the imposing group of patriarchs. The family tradition here would be very reliable.

The wood was preserved for the manufacture of relics, many of which hereafter, no doubt, from the want of a little authenticating care upon the part of their owners, will be deemed most apochryphal. Samuel Breck, Esq., personally took from the tree, as it lay in ruins, a limb, which he gave to Captain Watson, of the British Navy, to deposit in the Museum of Exeter, England. A large piece of it was sent by our valued

* Annals of Philadelphia, 2d edition, 2d vol., 8 vo.; Philadelphia, Elijah Thomas, 1857.

townsman, Samuel Coates, to John Penn, Esq., of Stoke Park, England, which the latter so highly valued as to mount it upon a pedestal in one of the apartments of his mansion, with the following inscription engraved upon a brazen tablet:

"A remnant of the great Elm, under which the Treaty was held between William Penn and the Indians, soon after his landing in America, A. D. 1682, and which grew at Kensington, near Philadelphia, till the autumn* of the year 1810, when it fell during a storm, was presented to his grandson, John Penn, Esq. Mr. West, who has introduced this tree into his celebrated picture, representing the Treaty, has mentioned a peculiar mark of respect shown to it, in more recent times, in the following words:

"This tree, which was held in the highest veneration by the original inhabitants of my native country, by the first settlers, and by their descendants, and to which I well remember, about the year 1755, when a boy, often resorting with my school-fellows, (the spot being the favorite one for assembling in the hours of leisure,) was in some danger during the American war of 1775, when the British possessed the country, from parties sent out in search of wood for firing; but the late General Simcoe, who had the command of the district where it grew, from a regard for the character of William Penn, and the interest he took in the history connected with the tree, ordered a guard of British soldiers, to protect it from the axe. This circumstance the General related to me, in answer to my inquiries concerning it, after his return to England."

PHILADELPHIA, PA., *July 11, 1868.*

DEAR SIR:

In pursuance of your late request, that I should jot down the various

points within my knowledge concerning the Penn Treaty-Ground and other relevant subjects, I would remark, that the

GREAT ELM TREE

under and around which the treaty with the Indians is supposed to have been made by William Penn, was situate about fifty feet from the present southeasterly line of Beach street, and about sixty feet southwesterly at an angle of ninety degrees from Eyre's line, and not where the monument now stands. The trunk of the tree leaned over in a southeasterly direction before its fall, so much so that goats used to run up into it along the trunk and out upon the main limb; and this lower limb, (on the side next to the river,) which also stretched southeasterly over the stream, appeared to be on a line parallel to the water, or the then wharf, over which it spread. The said limb was about one hundred and fifty feet in length. In the year A. D. 1810, only a short time before it blew down, Mr. Matthew Van Dusen, Sr., on whose property the tree stood, was advised to put a shore or prop under the limb, that it might be supported in case a heavy blow of wind should come. With this done, it might have stood to this day; but, although very proud of the tree, he neglected this precaution, and a few nights afterwards a severe gale of wind blew it over. It lay in that position for several years, each year getting less, of course, through being carried off piecemeal by the people to make canes, stools, frames, &c., out of pieces of the relic, until it was nearly all taken away, there only remaining say about eight or ten feet in length of the trunk or body of the tree attached to the broken stump, the roots remaining in the ground. This stump and stem-log was then hauled on a sled by ten horses (there being a small bed of snow on the ground) to Eyre's saw-shed, (where the carpenters of Van Dusen's shipyard, then and now occupying the

* It will be observed that Autumn should be Spring.

treaty-ground, whip-sawed their timbers and other lumber,) for the purpose of sawing it into two-inch plank to be used in making articles as mementos of the great and renowned treaty and tree.

My father, John Eggleton, informs me that he hauled it to the pit or saw-shed as above stated, but cannot remember the year exactly. He believes it was after peace was declared, as he knows that a part of it was sent to England, and thinks it was not sent during the war, while the people were incensed against Great Britain. In that case, he says, it might be in 1815 or 1816, as peace was declared in 1815. His account-books of those days, in which he had charged for the hauling, having been destroyed or lost since that time, he is unable to give the exact date, which we regret very much on this occasion.

An incident connected with the tree was related to me a few days ago by Washington Van Dusen, Esq., youngest child of Matthew, Sr., and his successor in the property, and which notwithstanding he was then a very small boy, not exceeding seven years old, he remembers as distinctly as if it were yesterday, viz.: A man by the name of Lawrence Hill, (Lall Hill, as he was commonly called,) who sounded his words through his nasal organ, on one occasion went up into the tree after its fall to tie a rope to the main upright limb, that was to be taken out or cut off, on account of decay. A large number of men and boys took hold of the rope, while some one was cutting at the bottom of the limb, and probably very awkwardly, as very few men know how to fell timber, so that it will fall in the desired place, without being split and ruined. Some of them called out to Lall to come down, as they were going to pull. Lall called out, through his nose, "Pull away, — you!" They did pull, and with a will. The rope broke, leaving Lall in the tree, and the pulling party in the dirt out in the road, for nearly every one

having hold of the rope fell, creating a great dust and causing uproarious shouts of laughter; Lall, of course, had his laugh and shout up in the tree.

Battery Hill, so called from having been the site of a battery of artillery during the Revolution, was a place extending say from near Maiden (now Laurel) street to Green Woods lane, (now Shackamaxon street,) and from the Delaware river to Queen (now Richmond) street; the front of which, along the river just below Shakamaxon street, was about seven or eight feet higher than the present grade of Penn street, which now passes through it. At Beach street it was about five or six feet above the present grade; at Allen street and Shackamaxon about the present grade, but below Shackamaxon, on Allen, the ground gradually rose, until about midway between Shackamaxon and the King's (now Frankford) road, to the height of about four feet, and sloped off towards and to said road. There was a low place between Allen and Queen street, extending from a point about four hundred feet below Shackamaxon street toward Marlborough street, inclining towards the river until it met the river at the treaty-ground, (this low place or part of it, can yet be seen in the yard of Thomas Vaughan, Esq., on Richmond street above Shackamaxon street). But on the northwesterly side of Queen street, beginning at this low place near Shackamaxon street, and extending in a northerly and easterly direction, the ground rose gradually to a height of about ten or twelve feet above the grade of the present street, (Queen or Richmond,) at a point about Crown (now Creese) street, and descended to the river, and extending northwesterly to about where ran Prince street (now Girard avenue) at about the present grade, subsided into a hollow toward Frankford road, and again rose to the Frankford road. This spur, connecting with the high ground forming Battery Hill, was called Sheep Hill.

On Battery Hill, before and some time after Penn street was cut through it, there stood a very long brick blacksmith shop, extending from Beach street nearly to Penn, which many of our present citizens well remember.

The deed, conveying to Anthony Palmer the tract of land on which the treaty was made, runs as per memorandum attached :

ROBERT WORTHINGTON TO ANTHONY PALMER.

Beginning at a point on the bank of Delaware river, in the middle of the old lane, thence up the same north 15° west 182 perches to a post by the King's road ; thence north $7\frac{1}{2}^{\circ}$ east 115 perches to a post in Isaac Norris' land ; thence southeast 156 perches to a post ; thence northeast by Norris' land 30 perches to a post in old lane ; thence down the same southeast 60 perches to Gunner's run (Tumánaramingo creek) ; thence down the several courses to the river Delaware ; thence down the river about 130 perches to the place of beginning.

Very respectfully, yours, &c.,

JONATHAN EGGLETON.

CHARLES J. LUKENS, Esq.,
Philadelphia.

PHILADELPHIA, *July 16, 1868.*

DEAR SIR:

There is a certain—perhaps a very uncertain—sense of awkwardness in changing from the impersonal *it*, or the editorial *we*, to the egotistical *I*. But as, from the nature of the case, this selfish personality is required properly to authenticate the new and valuable facts herein first adduced ; as you have entered so cordially into the presentation of the general subject and its graphic illustrations, and as this seems naturally to follow the letter of Mr. Eggleton to myself, for the moment I retain only a cognizant view of the public, and look directly toward yourself,

the public meanwhile remaining full partners of the conference.

On Wednesday, July 15, 1868, an exceedingly sultry day—and the seventh or eighth of like nature—in company with Mr. Jonathan Eggleton, draughtsman, of the City Surveyor's office, who, from his intimate knowledge of the district of Kensington and its people, was to present me, I went up into the immediate neighborhood of the treaty tree, to make inquiries from some of the old residents most likely to be conversant with facts now important to determine.

We were fortunate enough to find at home, in the order named, Messrs. Jacob Tees* and Washington Vandusen ;—Mr. Tees at his store, within a few steps of his dwelling, both on Beach street, Nos. 1208 and 1220, a little below the treaty obelisk, on the opposite or west side ;—and Mr. Vandusen sitting under the grateful shade of a paper mulberry tree, in front of his residence, No. 915 Hanover street, east side, one door south of Allen.

Mr. Jacob Tees, on Saturday, July 11, 1868, seventy-eight years old, is yet vigorous in body and mind, his recollections being only affected by the general proportion of uncertainty in all oral human testimony, after the events or facts it concerns have lapsed many years.

Mr. Tees, who in his time has built one hundred and two sea-going vessels, besides many coasters, said that, in company with other shipbuilders, in 1823 he contracted for, and in 1824 he built a frigate, whose name he had forgotten,† for the government of Columbia, South America, which was finished, approved, launched, paid for, and delivered, and in due time arrived out. In the former year, Fairman's Mansion, which had for quite a number of years been the property and the home of

* Pronounced *Teece*.

† On reading to him Washington Vandusen's reminiscences, he recalled the name perfectly as the "De la Plata."

Matthew Vandusen, Sr., was still standing, almost immediately upon the town side of the river road, above Hanover street. In their arrangements for constructing vessels, the brow-stage reached within some forty or fifty feet of the opposite or river side of the river road. When they came to lay the ways for the frigate, they ascertained that they had not room enough to build her between the usual brow-staging and the water. Accordingly, as all thoroughfares have to admit obstructions in the exigencies of building, whether for sea or on land, without troubling themselves to secure a permit from the District Commissioners, they built a new brow-stage, quite to the river side of the road, the slope of which terminated perpendicularly at the height of a man, and afterwards filled in both sides of the road with timber, leaving only a single cartway open between the brow-stage of the frigate and the front fence of Fairman's Mansion. This infringement on the public road incensed Franklin Eyre, who threatened to ride over Mr. Tees the first time he should see him, although, shortly afterwards, the latter purposely gave an opportunity, which the former did not take. One object of Mr. Tees was to constrain the District to pay for and remove the Fairman Mansion, long doomed to destruction, for the opening of Beach street, directly on which it stood, and reaching within two or three feet from one side to the other. Mr. Eyre, much better-natured than his threat, probably thought no more of riding over anybody, much less a friend and neighbor; but, bent on having better roadway, next directed his wrath against the front fence of the mansion, which he insisted should come down, in spite of every thing and everybody. Matthew Vandusen, Jr., Washington's older brother, being then away in the South, cutting live-oak, Mr. Tees vowed that it should not, until the District had first paid the family the proper damages, the matter already having remained so

long unadjusted that it had become very doubtful whether they would ever receive one cent. Afterwards, upon the return of Matthew, Jr., then young and fiery, high words passed between him and Eyre about this dispute, though nothing further occurred. The house had been torn down during Matthew, Jr.'s, absence; but Mr. Tees had succeeded in having twenty-five hundred dollars allowed for it. The river road, or rather the mere curved turn-out around Fairman's Mansion, had been vacated, and Beach street had gone through on the present lines. This was in 1824-5. A little after, Mr. Tees, operating alone, built a corvette for the Mexican government, upon the same ways. This vessel's Mexican name was the "*Tip'eyak*," (probably "*Tepeáca*;") but while here, waiting in the stream a long time, unrigged, she was called the "*Kensington*." With her appointments and armament, she was to cost \$250,000, but the ship-builder's contract price was \$190,000. Her style of "*Kensington*" was devised to secure her builders, until she should be settled for and delivered. The Mexican government of that day really sent enough funds to pay for her, but it was supposed that, somewhat in the manner of some modern office-holders, the Mexican minister at Washington reserved a slice, and the Mexican consul at Philadelphia secured a slice, and the two Mexican commissioners, charged with the superintendence of the construction of the corvette, obtained slices; and so, while their government disbursed the funds, they dispersed them, and the vessel was not paid for. At length, inquiry came from the Mexican government concerning the requisite residue of the purchase-money. The answer was returned \$115,000, so that only \$75,000 had been paid to the builder. Her government then abandoned her to the latter, who ultimately disposed of her to the Russian government, although he never learned her Muscovite name. Mr. Tees's object in

particularizing about these men-of-war was to show why he should have certain points connected with the main subject of our present inquiry freshly in recollection. He felt assured that these vessels, on the stocks, covered the precise location of the treaty tree; which location, from the projection of the porch of the Vandusen homestead, the width of the front garden, the abrupt descent of the steps outside, on the bank adjoining the road, and the width of the road itself, immediately on the opposite side of which stood the treaty tree, he fixed at from twenty-five to thirty-five feet, and most likely thirty, from the present southern line of Beach street. He remembered the proposition of some of the neighbors to Matthew Vandusen, Sr., to place a permanent support under the great bough of the tree, and Matthew, Sr.'s, chagrin at the fall so soon afterwards; and he also remembers the clamoring of the goats along the trunk and the great horizontal bough; but insisted that the size of the woody part of the tree had been much overrated, the stem near the ground not exceeding in bulk the size of a hundred-gallon puncheon, or say four feet diameter, and the great branch not surpassing the diameter of the bilge of a flour barrel, nor keeping that dimension beyond fifteen to eighteen feet from the trunk.

The children of Matthew Vandusen, Sr., were, in order of birth, Nicholas, Matthew, Jr., who lived in the Fairman Mansion till he was about of age, John, two or three daughters, and Washington, who was the youngest of all.

Washington Vandusen, who was a little child when his father died, a few years after the fall of the elm tree, lived on in the old homestead, wherein he was born, with Susanna Till, a spinster, an old friend of the family, who took boarders there, until he was nearly of age, say 17 or 18, and she had to leave it, on account of its demolition. After he married, Susanna Till went to live with him. Washington was a little

child $4\frac{1}{2}$ or 5 years old when the tree blew down, and but two or three years older when his father died. Mr. Tees remembers the old buttonwood whose limb had been converted by Col. Eyre, the father of Franklin, into a belfry; but thinks it stood rather farther away from Beach street than did the Treaty Tree. Mr. Tees agrees with Mr. Vandusen in regard to the location, size, position and arrangement of Fairman's Mansion, and of the Treaty Tree, with respect to the line of sight from it, and says that the line of the easterly or upper end of the mansion coincided almost exactly with the westerly or lower side of the treaty monument, the south-easterly corner of the cellar wall being within a foot or two of the gate leading into the monument enclosure. He believes, in fact, that the whole of the foundation, cellar walls, ovens and all are there undisturbed beneath Beach street pavement.

Col. Eyre, out in the revolution, was the father of Jehu and Franklin. Manuel Eyre, the Colonel's brother, had also a son Manuel. The descent of the property east adjoining the Vandusen or Treaty plot was from the Colonel to Jehu, Jr., from him to the present owner, Mary, from whom it will pass to the younger members of the family. These names are given for the benefit of those who may have in future to consult and weigh the evidence of documents.

Mr. Tees remarks that the river road had no actual existence as marked on our illustrations from the old surveys and descriptions. Eyre's house and others were properly located on the northerly line of Beech street, east of Fairman's Mansion, long before Beach street existed, except on paper. The road swept out of Beach and Hanover intersection, as represented, to run between the mansion and the river, but immediately swept into it again, as represented by the dotted lines of the present street, by a curve exactly like the former.

Mr. John Eggleton,* father of Jonathan,† tells the latter, that the great elm was about four to four and a half feet through the butt. There is, however, nothing more deceptive, than *remembered* eye-measurement, especially of globular or cylindrical bodies. If any credible witness produces the memorandum of an actual measurement, of course we must believe him; but amongst recollections we may be allowed to choose; and recollections in opposition to a recorded measurement stand no chance whatever.‡

Mr. Washington Vandusen, who is erect and very hale and vigorous, and on the 31st of July, 1868, will be exactly sixty-three and a half ($63\frac{1}{2}$) years old, was born in the Fairman Mansion, the property and home of his father, Matthew Vandusen, Sr., and lived in it until early manhood. It was destroyed by the condemnation of the district, in order to open Beach street, while he was away, in Georgia, in 1824-5, as one of a party cutting live-oak for the *De la Plata*, the frigate whose name Mr. Tees at first could not recollect. His family, besides the materials it comprised, received twenty-seven hundred dollars (\$2,700) for it; and he thinks would have received considerably more but for the haste of his friend Mr. Tees and partners, who greatly hurried the negotiation, wanting the house out of the way and Beach street cut through. Although, at the same time, he believes, they were under the conviction, that they were doing the very best thing for the interests of his family. He said his father used to tell the citizens, when they talked of condemning the homestead, that they could not purchase it, with his will, unless in exchange for another near at hand equally good. This would have been difficult, for it was a large, well-planned and exceedingly well-

built mansion. It stood immediately facing the Delaware, its lower or western front parlor window looking almost in a straight line, at right-angle to the river road, towards the Treaty Tree. The house was about fifty feet in depth, there being only a foot or two between its rear and the present building line of Beach street. Its length, with the river and along the road, was about one hundred feet, made up thus, 18 to 20 feet in a division on the extreme east, (wherein dwelt, in Mr. Vandusen's time, Michael Lynn§ and family, and where were born Lynn's sons, Robert and John, and where afterwards Griffie Vaughn dwelt), about 30 feet in the front parlor, about 18 feet in the great hall through from front to rear, about 15 feet in the piazza, partly open and partly closed, and about 18 to 20 feet in the kitchen, at the extreme western side of the house. The front parlor occupied half the depth of the mansion from Lynn's portion to the hall, going from the eastward; the back parlor and the stairway took up the remainder. This stairway was large enough for four persons to ascend it abreast. The second story was arranged in a similarly commodious style. There was a vaulted and paved cellar under the entire body of the house, except beneath the part allotted to Michael Lynn, which was all taken up with four large and fine ovens communicating with the cellar; he thinks no cellar under the kitchen. The lower story of the porch at the western end was open, front and sides; the projection at the eastern end, corresponding architecturally with the porch, was on the ground floor, a pantry communicating with the front parlor. The house was well situated on gently rising ground, and took any light breeze in such a manner as to be splendidly ventilated in summer, being, Mr. Vandusen thinks, the most pleasant dwelling he ever was in. It was two stories and a half high.

* Now 78 years old.

† 57 years old in November, 1868.

‡ Mr. Tees' statement was revised in the presence of his son, Mr. Lewis Tees.

§ The shipsmith.



The porch and pantry projected about eight or nine feet from the front, and the front garden fence about seven feet further. Then there was a sharp little declivity to the river road. The road itself about 30 feet wide. On the opposite, or river side of the road, stood the Treaty Tree, about five feet from the beaten track. This would place the Elm 50-1 to 55 feet from the mansion.*

Though quite a small boy when it occurred, Mr. Vandusen recollects very well Lal. Hill's retort, and the fall of the men in the dust, as detailed in Mr. Eggleton's letter. This was after the tree had blown down.

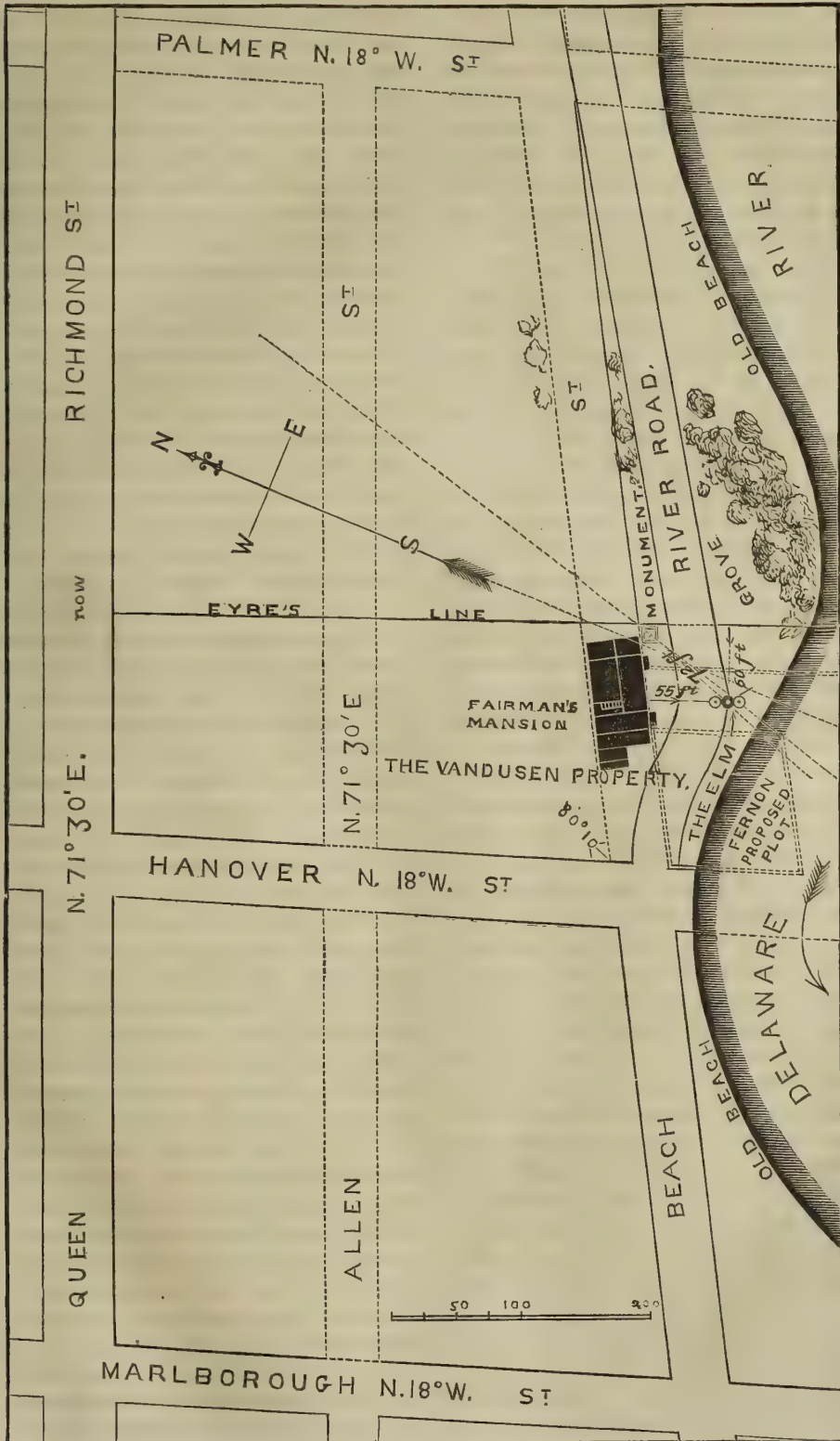
Mr. Vandusen gives the exact position of the trunk of the Great Elm, thus: The ground formerly belonging to his father, Matthew, Sr., and now to himself, bounded by Eyre's line, the same with the upper rough fence of the monument, from Eyre's line to Hanover street, is divided into seven equal lots of 21 feet 4 inches front on Beach street, as far as they will run that width, the allowance under or over being in the front of the seventh lot. He knows that the tree stood in the third lot from Eyre's line, near the easterly line of the fourth lot. The eastern side of the tree was near the middle of the third lot, the western side very close to the fourth lot.† This brings the exact centre of the butt of the tree on an angle of 90 degrees, 60 feet westerly, or down Beach street from Eyre's line. Washington Vandusen's estimate of the diameter of the Great Elm is five to six feet. There was an ancient buttonwood, standing a few feet easterly from Eyre's line, on ground now occupied by Edward V. Gorgas, No. 1325 Beach street, as a wood-yard,

* Mr. Tees holds stoutly to thirty feet. Both gentlemen place its centre somewhere on the line parallel with and sixty feet westerly from Eyre's line. The difference is not quite three thicknesses of the trunk itself, i. e. eight feet as given by Watson.

† Here again is a confirmation of the eight feet diameter. The middle of the lot would be 10 feet 8 inches from either line, 2 feet 8 inches may be considered equivalent to "very close." This deducted from 10 feet 8 inches leaves 8 feet as the thickness of the trunk.

whose stump yet remains in the earth. Mr. Vandusen, Mr. Eggleton and myself, went to visit the stump. It was not visible, being piled entirely over with cord wood; but Mr. John Hansbury, the young man in charge of Mr. Gorgas' office, undertook to show us the exact range of the centre of the stump, which measured 53 feet parallel with Eyre's line to Beach street. This buttonwood was a large and particularly marked tree, from the fact that Manuel Eyre‡ had put on it, before Washington Vandusen's time, a bell to mark time for the neighboring ship carpenters, and Mr. Vandusen's recollection is very clear, that the Great Elm stood a little further away from the Beach street line than the buttonwood did. Making this allowance at 55 feet, we obtained by the tape line, 72 ft. s. s. w. $\frac{1}{5} + s$. (surveyor's bearing, s. 20° west,) from the apex of the monumental obelisk, planted in the north-eastern corner of the yard, at the same distance, say $6\frac{1}{4}$ feet, rectangular, from Eyre's line and from Beach street. This memorial stands in the centre of an enclosure about $12\frac{1}{2}$ feet square. There is a trifling element of uncertainty here, from the present obscuration of the stump of the buttonwood; but this could soon be disclosed, when absolutely necessary to locate the centre of the Great Elm with exactitude. At any rate, it never has been marked upon a published plan with the least approach to its present accuracy, besides the accompanying means of designating it with certainty, for years to come. From a period long before the vacation of the river road, and the removal of the Great Elm, to the present instant, the ownership of this ground has remained in the one family, passing merely from Matthew Vandusen, Sr., to his son Washington, who himself gave me this information, accompanying it with genial remarks, and with chalk

‡ Mr. Tees says Colonel Eyre of the Revolution, brother of the elder, and uncle of the younger Manuel, and father of Franklin Eyre, put the bell in the buttonwood.



diagrams drawn upon the ship timber whereon he sat, while, standing immediately at hand, I copied them in my note book. The Marine Railway on this ground is now carried on by Washington's two sons, John and George, so here are three continuous, lineal generations of the Vandusens, sufficient to prevent any uncertainty whatever.

The remnant of the great elm was sawn up by Franklin Eyre, who had the shipyard east adjoining Vandusen's, and who thereby obtained the larger portion of the wood then remaining. Up to the time of this sawing, or rather until his death, which likely occurred rather before, Matthew Vandusen, Sr., who had always utterly refused to sell any part of the tree, with a generosity and appreciation which does him honor, had invariably freely given away pieces of it to all applicants. Had he preferred to sell the relics, he could have made a large sum of money by it; but he chose the nobler part; and his descendants may well be proud of it. Washington Vandusen thinks that the Eyre family have much the larger portion of whatever actual wood of the great elm there may be remaining, as Franklin would naturally secure, in sawing, most of it himself. I believe the same may be said of them, as of Matthew Vandusen, Sr., above; the wood they have presented, and might again, as an exceedingly great favor; but never did, and never would, sell any of it.

In pursuance of the Fernon attempt to establish a square, the damages for 147 feet, more or less, on Beach street, and 190 feet towards the river, Mr. Vandusen said, were assessed at \$51,000. This the Court set aside; and thus the affair has remained in abeyance to this day. The reader will remember, that this little tract contains the very heart of the treaty ground. Inside this, all admit the great elm stood; and consequently, within it the high councils of the two parties must have deliberated and finally acted. I think, therefore, the

sum was very moderate, even for the better and cheaper days when the matter was last agitated. The ground rests at about \$6 per front foot on Beach street to Allen, and on Richmond street to Allen again. On Beach street to the river there is no definable limit between \$12 and \$20 per foot. These points I obtained from him with regard to a business consideration of the proposed matter by business men. The number of feet from Richmond street through to the river, to count at $6+6+20=32$, would be, 951 to 955 feet; take the larger number, and \$36 per foot through from Richmond street to the Port Wardens' line. The \$36 represent the six per cent. interest of \$600; this, multiplied by 955 feet, produces \$573,000, or, in round numbers, \$600,000, as the value of the ground. There is, in addition, the value of the buildings, which is not so easy to estimate; but say \$300,000 more. The reclearing and embellishing of this sacred spot—the birthplace, so to speak, of the Commonwealth of Pennsylvania—is no trifling matter, and can be accomplished for no trifling amount. The first point is to secure the ground; and remove the Penn Society's Memorial to the exact spot. The additional contribution for the piers, the landscape gardening, and the monument and other appointments, would vary from \$1,400,000 to \$2,000,000 more. The State should appropriate the money for the ground and the encumbering buildings; the people should contribute that for the other purposes. Ranging the present population of the State somewhere between 3,500,000 and 4,000,000 souls, it would be about fifty cents a head, varying from those able and willing to provide many times the quota to those unable to give aught; and, with concerted effort, the money could all be raised the first election day, by having contribution boxes in charge of a few trusty citizens at the polls, as, although the women and children do not vote, they could hand in their mite through the men.

Washington Vandusen says, that suckers from the roots of the elm frequently spring up all over the old ground, several hundred feet from where it grew. With regard to the scion now standing directly between the monument and Gorgas's counting-room, whose authenticity is undeniable — although Mr. Vandusen says it has been transplanted from the spot where it first made its appearance as a sucker—and which is now a flourishing tree of between fifty and sixty years old, my own measurement, by the tape-line, on the 16th of July, 1868, shows it to be eight feet seven and a half inches circumference, four feet above the ground. This averages it as thirty-four and a half inches, or nearly three feet diameter, which, but for the measurement, and my knowledge of its correctness, I would not, from a casual or even a careful look at the tree, believe myself. The measurement was taken at the smallest point. This tree forks very low, within five feet of the ground, and is deeply striated on both sides, so that carelessly, at a little distance, it might be taken for two. The tape-line was carefully passed around and tested just where the trunk loses the swell of the roots, and the boughs begin to fork. Before it blew down the great elm was, in round numbers, five times as old as this, its descendant. The annual rings become narrower and narrower with each succeeding year, so that it would not be correct to say that a tree of the same species, five times the age, must be five times the diameter; but it would be a sound analogical deduction, that, all other conditions the same, a tree of about five times the age must be of about three times the diameter —by this example, nearly nine feet; therefore, I rely implicitly on Watson's dimensions, namely, twenty-four feet circumference, or eight feet diameter for the great elm.

Taking the varying positions of these two gentlemen, dwellers and *habitués* of the very spot for many years, and obtaining their average, we reach this very

curious solution. If we confirm Mr. Tees' position, the bark and part of the wood of the tree would run inside the equated space on the south; if we confirm Mr. Vandusen's position, the bark and part of the wood, as before, would encroach upon the equated tree on the north; if we take the equated elm, its northern substance would invade Mr. Tees' elm, and its southern Mr. Vandusen's elm, because all are parallel with Eyre's line, at sixty feet distance, and they do not vary the confirmed thickness of three great elms.* In the centre of the average spot, then, is the place to plant the centre of the monument.

A glance at the double dotted line, representing the proposed square of not exceeding one hundred feet, as established, though not carried out, by the Pennsylvania Legislature, will show that all these points are thrown nearly into the middle of the proposed new street in the east. This is *maladroitness*, with a witness! We may rather congratulate ourselves, that the matter is yet inchoate.

I might indulge my imagination with the artificial and the art-natural beauties which could be here displayed, but I refrain. "First catch your hare." Although I firmly believe that the desire to consecrate this spot to public use is rooted in the very hearts of our citizens, and that the first real step towards organization will effect it. With the highest hope of such a consummation I rest

Very truly yours,

CHARLES J. LUKENS.

SAMUEL SLOAN, Esq.,

Philadelphia.

THE INDEX.

The little monumental Obelisk erected by the Penn Society does not mark the exact spot whence upsprang the trunk of the great Elm. The tree stood some

* Mr. Vandusen says that the two men-of-war were not built over the site of the great elm, but a little below it.

seventy-two feet south southwest, southerly, or s. 20° w. from where stands the memorial, which was placed to suit the convenience of the owner of the ground. The very spot was formerly marked in the shipyard, by a post, driven deeply in the earth, "about fifty feet back from the line of Beach street." It is to be hoped that the exact triangulation was securely recorded. This monument is of ordinary white Pennsylvania marble, liable to crack in the weathering, is about five and a-half feet high, with a base of about four feet square, and reads, as follows :

NORTHERLY SIDE

Facing Beach street.

Treaty Ground
of
William Penn
and the
Indian Natives,
1682.
Unbroken Faith.

EASTERLY SIDE.

Up Beach street, towards Palmer.

Pennsylvania
Founded,
1681.
"By Deeds of Peace."

SOUTHERLY SIDE.

Facing the Delaware.

William Penn,
Born, 1644,
Died, 1718.

WESTERLY SIDE.

Down Beach street, towards Hanover.

Placed by the
Penn Society,
A. D. 1827.
To mark the
Site of the
Great Elm Tree.

Site here was unfortunately misspelled scite by the marble-cutter. Just below Hanover street, on the northerly side of

Beach, stands the old Bolivar House. Immediately outside the enclosure, west of the obelisk, is a thrifty young buttonwood tree, and directly east of it a flourishing elm, whose branches overarch and droop southward below the monument. Next below the enclosure is a sign projecting at right-angles to the pavement, "J. & G. Vandusen, Penn Treaty Marine Railway."

THE VERY SITE.

Clarkson observes: "It appears that though the parties were to assemble at Coaquannock, [*i. e.*, Philadelphia,] the Treaty was made a little higher up, at Shackamaxon." Roberts Vaux, Esq., here comments: "The probable cause of the change was the convenience of both the natives and Penn." This *may* not necessarily be a change. For exceeding impressiveness, they *may* have formed a joint procession from the first gathering-place to the appointed ground. Though this, our mere speculation, would neither be Indian-like nor Quaker-like, the savages preferring a personal independence in reaching a rendezvous, the Friends disliking pageants.

Some have spoken of Upland, or Chester, Pa, as being the Treaty-ground. That was an old settlement, and protected by forts, consequently most unlikely to be chosen by Penn, who would naturally be careful to show the Indians his sense of the desirable perfect equality of surrounding circumstances. Judge Peters observes: "I have always understood that 'Talks' were held with the Indians at Chester, *preparatory* to the conclusive Treaty." A likely enough thing, Chester being the seat of government of the Province. Nicholas Collin, Esq., concludes it "highly probable that 'the Treaty was held at [or near] Philadelphia, as being pretty far into the 'country, and by its site destined for a 'capital.'" The more, that it was midway between the settlements of Burlington, N. J., and Chester.

[To be continued.]

WEALTH WASTED IN TEMPORARY STRUCTURES.

IN an absolutely new country, men cannot build for posterity, or even for their own old age. The necessities of their condition demand instant shelter and frequent patching. Thus it happens that the pioneer may erect several tenements on nearly the same ground, and have scarcely more than a hut to dwell in at last. From the peculiar conditions of our country, settled on its early border, the Atlantic seaboard, by all degrees of society simultaneously, numbering nine or ten generations of born inhabitants in the older sections to none in the newer, between long-dwellers and new-comers, amongst birthright Americans and immigrants from all nations, everywhere, it follows, that buildings must be observed of every possible grade.

No fault is to be found with the squatter, forced to construct his domicile of crude materials with few and imperfect tools, managed in varying skill or awkwardness by his own hands, if he obtains merely mitigated discomfort within and unmitigated ugliness without. But the comfortable citizen, descended through a half-score more or less thriving American ancestors, thus feeling himself very properly an American of the Americans, or one of a race long identified with the mainsprings of governmental action, has not the same excuse for living in or putting up a structure, temporary, inconvenient, and homely, but not home-like. In the great cities, ordinarily speaking, we practice too much demolishing and re-erecting, because we incline to the cheap principle. Rows of many adjoining stores in one direction, of many connected dwellings in another, all built simultaneously, by contract, and all alike, for the sake of cheapening the whole by the repetition of many details of the same form and measurement, used to be found in all our towns and cities a gen-

eration ago. No picturesque landmarks existed for the hurrying stranger, enabling him rapidly to master the great features of the strange locality; none of the quaint and charming associations of difference in date or variety in style, lightened the cares of the sedulous burgher; but, unless every door was counted from the nearest street corner, perils lurked by the way for the faithful husband, or wife, returning home after dark, when the almanac foretold moonlight, and the city gas-trimmers remained at the station-houses, while, from the intervention of clouds or rain, the natural luminary of the night did not appear. Along with this was a provoking similarity of dead-latch keys; so that to open a door with your key was no proof of its being your own door. More than one modest wife has rushed into the arms of another's lord, who perhaps was never afterward quite satisfied that she did not mean it. More than one virtuous husband has found himself suddenly in the chamber of his neighbor's startled spouse, the latter's owner heard by both tramping rapidly up the stairs. Hence, pure characters suffered in reputation from architectural sameness, whilst the evil-disposed escaped the results of their delinquencies, because, at a little distance, the closest observation would not determine whence they emerged. In fact, business and domestic delays and inconveniences of all kinds resulted from this cheap similarity to such an extent, that even people, whom no provocation could induce to swear, probably felt the animus of the little Frenchman's anathema upon Philadelphia, because—"Ze dam houses were so moche alike!"

It is true, the remedy is more and more searching yearly; and—not altogether inseparable from the little old many-gabled, curb-roofed dwellings, with their intermixture of imported black

bricks in the walls, and conveniently-dressed, but easily worn-out soap-stone door-steps—eloquent of the times of the Swedes, Dutch, and Quakers — picturesqueness of form has really appeared in our streets. The next desideratum is picturesqueness of color, which no doubt will be exhibited before long.

If stores or residences were built of good substantial and enduring materials, with light and ventilation, lofty rooms, thorough conveniences, and chaste style, after the coherent plans, sections, and elevations of an experienced architect, they would cost perhaps fifty, it might be, even an hundred per cent. more than the present expense of the same accommodations; but, throwing out the expense of preservation, it would be a completed investment, bound to remunerate in the end. The edifices would not fall; and there would be no need to tear them down. Once built, they would endure for many generations. In Philadelphia, Stephen Girard, formerly, and Dr. David Jayne, of late years, practised upon this principle; which does not look to the ruling rate of interest; but constructs out of the best purchasable materials, in the best possible manner. There is perhaps a mixture of pride and vanity in high architectural abstractions realized in stone, brick and mortar; but this may charitably be passed over, in favor of those who have done, or caused others to do so well. A good story is current, to this effect, that when the marble steps of the rear of the former United States Bank, on Third street, below Chestnut, built upon the bed of old Dock creek, afterwards purchased and converted into his private banking-house by Mr. Girard, gave way, that cool calculator drove piles very deeply, side by side, till there was no more room; and rebuilt the stone-work from the foundations, until all there was made secure and solid, at the expense of some eighteen thousand dollars. It is reported that, as it approached completion, he was observed

one morning, very early, looking on, with his hands gracefully disposed beneath his coat-tails, saying to himself, "Now it will last forever." Here was something away from the street, which the public did not see, use, or care about. But to him, that subsidence might reach the rear-wall, and ultimately destroy the building. What, then, was eighteen thousand dollars to Stephen Girard, compared with the sense of satisfaction in having secured against possible ruin a noble edifice? Dr. Jayne's great building is reported not to have netted him in revenue over two and a-half of one per cent.; probably now does not net his estate more than that. But it induced the erection of many another fine store, and therein the doctor had his reward, beautifying the city of his good fortune and adoption, and increasing its prestige among business men at a distance. What cared he for percentage in comparison? These two men, after having grown highly prosperous, always acted on the same principle; and have had scores of worthy followers, many of whom, like themselves, have not even been natives of the city they so lavishly embellished.

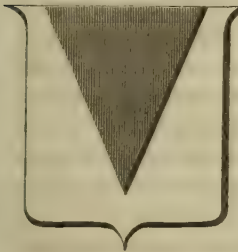
What, then, is the cheap principle in the event? The expenditure of so much time, taste, and money, as shall enable the disburser to become the possessor of that which—whether garment, movable, store, or house, being of good material, careful construction, artistic execution, and thorough adaptation—shall answer well and look well, until fairly worn to pieces, after many intervening fleeting fashions shall not have a solitary representative left. Comparatively, if you wish to spend little, spend without sparing on essentials; if you prefer to spend much, spend pinchingly upon the ephemeral caprices invented for the advantage of trade. Yet, as customers always seek the truthful trader, property-owners should always consult the skilled and true architect.

HERALDRY.

INTRODUCTORY REMARKS.

WHEN Sir John Froissart, the genial chronicler of the days of Edward the Third of England and his consort, the good dame Philippa of Hainault, is discoursing of a skirmish between the English and Poitevins on one side, and the French and Bretons on the other, wherein Sir John Chandos, the great English captain, then seneschal of Poitou, lost his life, the old monk says: "While the French and Bretons were considering the most advantageous manner to begin the onset, Sir John Chandos arrived with his company, his banner displayed and flying in the wind. This was borne by a valiant man-at-arms, called James Allen, and was a *pile gules on a field argent.*" Here, by synecdoche the banner is put for what it contained, namely, the coat of arms. Elsewhere, Froissart had previously spoken of the coat of arms, depicted on this banner, as "*argent, a sharp pile gules.*"

"*Argent, a pile gules*" — for the "*sharp,*" although it might be correct,



as the description of a very attenuated "*pile,*" is, judging from the rolls of the Herald's College, as given in the various armories, a pleasant redundancy;

but "*Argent, a pile gules*" — struck our boyish imagination with amazing force. What was the signification of those cabalistic words? The dictionaries would not reply. Clearly, they meant something to Sir John Chandos and his followers; they meant something to Sir John Froissart; they meant something to the knightly contemporaries for whom Froissart wrote: what did they mean? The notes of Mr. Johnes'

edition of the Old Annalist referred to Heraldry; and we had recourse to the article on Heraldry in the only Encyclopædia we possessed; then to other articles in similar repositories; then to such elementary treatises on the matter as fell in our way; and, finally, to the great authorities, on the subject, such as Guillim, Edmonson and Berry, until, in the course of years, we became quite adept, in an amateur fashion, in the science and the art.

"For what purpose?" growls the sturdy utilitarian republican. "Did we not sweep away all that in the revolution?" No, my dear sir, we did not. At the very beginning of the revolution, the Continental Congress appointed a committee to devise a national flag, whose heraldic fitness and beauty first flashed upon humbled Britain, and an astonished world, when Burgoyne capitulated to Gates, at Saratoga, on the poet's

"Field of the groundless arms."

The great seal of the United States had to be conformed to the rules of Heraldry. The arms of the United States, and of the several States, the seals of States, towns and corporations, all proceed from and rest upon the science of Heraldry. The self-manufacture of crests, the self-assumption of armorial bearings, by a citizen of a Democratic republic, based upon the political equality of men, is, in truth, ridiculously absurd. Though there is no more reason why those citizens descended from ancient "gentlemen of coat-armor" should refuse to preserve, if agreeable, the old testimonials of distinction, than that they should receive and preserve inheritances of money or land from their ancestors. George Washington was entitled to use, and always did use, as his carriage-panels

and book-plate testify, an ancient heraldic escutcheon, which he could, if he chose, though he did not, have honestly quartered with other coats proving his descent from the royal lines of England and Scotland. Oliver Cromwell, the Roundhead, sneered at by the cavaliers of the time, as a plebeian brewer, could have similarly shown his near cousinship to Charles the First, and consequent descent from the same kings and princes of England and Wales.* Coats of arms on book-plates, seals and carriages are constantly used, and ever will be, by many of our most unostentatious citizens, descendants of the persecuted immigrants of good families, who led the original colonists of North America.

So, then, it seems, that Heraldry will always retain some charms for the curious, at least; and may as well be studied by inquiring youths, or gentlemen of leisure, as many other things, which have lost their swaying influence upon the destinies of the earth.

There now arises the question, "What has all this to do with modern architecture?" A great deal. These emblems of the old worthies were lately found to be a most befitting ornament to the gothic halls of the new British Parliament House. Heraldry numbers among its many figures very nearly two hundred different styles of crosses. What more appropriate, if a congregation thus determined, than to embody a selection from these on carved shields, used as corbels, or the apparent resting points of gothic arch-mouldings, or supposed to be hung, as insignia of the church militant, in the panels of the walls? Or,

suppose a gentleman of romantic taste, not caring particularly for his own coat-of-arms, even as a water-color in a glass frame, and yet willing to acknowledge eminence in others: who should hinder him from displaying, upon his library wall, or, better yet, in his stained-glass windows, the escutcheoned emblems of the United States, of his own State, Governor Winslow, Captain John Smith, William Penn, George Washington, Chaucer, Spenser, Shakspeare, Beaumont, and Fletcher, Dryden, Somerville of the Chase, Byron, Sir Walter Scott, and William Beckford, the author of the Caliph Vathek, the young Englishman, who wrote, in a marvellously few hours, that novel in *la langue Française*, since universally allowed to be classic, the third time only that that feat was ever accomplished in French by any foreigner; and who had, immediately after, a six-weeks brain fever for his pains; who is known, moreover, to all lovers of architecture, as the planner, builder, and resident of Fonthill Abbey, Wilts, England,—the sale of whose articles of *virtù* occupied the attention of the London public during most of the summer of 1823*—to give which striking conception of architect, James Wyatt, its proper effect in the landscape, he actually pulled down, in 1807, save one wing, afterwards known as the Pavilion, the spacious and noble mansion erected, from 1756 to 1760, by his father, Alderman Beckford, many of whose ceilings were painted by Casali the Italian, and which cost altogether £150,000.

From these and other considerations, and as a branch of rather out-of-the-way science, we, the junior editor, propose to give, with every number of this periodical, an illustrated paper on Heraldry, which we hope will engage the favorable attention of readers and perhaps facilitate, or even felicitate some younger student's research.

* The writer does not wish this to be accepted in advocacy of privileged condition. The best specimens of the English nation are mostly derived from the gentry, because they are the cultured division of the inhabitants. This argues nothing for blood, because the nobles proportionally are not equal to the gentlemen, nor are the higher nobility and the princes relatively to compare with the barons. Our own educated classes, varying as to special families, from our happy preference of gavel-kind, or equal distribution, to entail, or descent by primogeniture, are by right and social rule the highest of the nation, but it is by virtue of their innate faculties improved by acquisition. Superior organization prepares for superior education, but this organization may occur in any class of society. The intility of the European systems is seen in the fact that no other Cromwell, much less Washington, has ever been produced.

* Graphical illustrations of Fonthill Abbey, by J. P. Neale, London, 1824.

IMPROVEMENT IN THE RIVER VIEW OF PHILADELPHIA.

IN Philadelphia, as viewed from Camden, there was, during the elder years, an unbroken uniformity,—relieved only by the two shot-towers, the square one of Paul Beck, in the southwest, long since torn down, and the round one, near the Delaware front of Southwark, owned by Thomas Sparks, yet remaining, Christ Church steeple, and another spire or two,—very soothing to the lover of the substantial things of the world, but distressingly monotonous. Since, more particularly within the last fifteen years, spire after spire has shot up, until a commendable variety obtains, which every day extends and beautifies. Still the view is better from almost any other commanding point, than across the Delaware; and owners and architects would do well to bear this in mind. The Delaware side, being the main approach, should not, of course, present the worst prospect. How gloriously, in this regard, the spectacle would be improved had Penn's intention, of having no houses or stores between the west side of Front street and the river, been carried out. Then Philadelphia could have stood proudly upon a bold bank, averaging forty feet high, throughout most of her extent, while commerce would have retained from six to eight hundred feet channel-width more of deep water. Although there is this consoling reflection: it is only where spaces are narrow, and crowds must create bustle and inconvenience, that crowds come. Had Market street been originally of its present width, without the old market-houses, its heavy business would not have been there, but somewhere else in straitened quarters. Broad street was laid out magnificently for business; but business would not go there, because space was provided for it. It is only where there is apparently no space, that business goes. And it is as the palatial

grand-drive and promenade that Broad street will soon become great.

A few lofty structures, within a square or two of the river front, would much enliven and diversify the prospect, while producing true effect. This would be enhanced by so designing cornices, doors and windows, as to have deep shades, and to throw heavy shadows. A memorial shaft or two, absolutely on the Delaware, would not be amiss. Should the cornerstone of the Washington Monument, in Washington square, ever germinate in a column truly exalted, say three hundred and seventy feet high, there would indeed be something worthy of the city. The fund must be well farmed by this time. But occasional great organized public efforts should be made to increase it, so as to carry the size and beauty of the pillar far beyond the original design. That which was very well, for a city of two hundred thousand inhabitants, is not commensurate with its enhanced dignity, represented by four-fifths of a million. Therefore, the Pennsylvania Society of the Cincinnati should be encouraged, by further subscriptions to them intrusted, to foster the fund, as they have faithfully hitherto; and, what they have not done, constantly to ask the great public for more. One great object for frequent and considerable contributions is the augmentation of what is already in hand, by safe investment. At five per cent. per annum, and only compounded yearly, it requires but fourteen years in round numbers to double any principal. The foundation, even, should not be laid with less in hand than seven hundred and fifty thousand dollars. Philadelphia has waited long for her Washington Monument; and she may as well erect a magnificent testimonial when she attempts it. The height named above, with the natural elevation of the ground, would place the observatory at least

four hundred feet above tide-water, and the absolute pinnacle some twenty feet higher. None will question the propriety of making the Tribute to William Penn, at the Treaty-ground, in Kensington, equally imposing. If the former typifies the rise of the nation, the latter symbolizes the earlier rise of the State. Here, then, all Pennsylvania should be proud to pour her wealth to do honor to her wise and good Founder.

A shaft of the same altitude, rising almost from the water's edge, would appear considerably higher, though really lower, and on a much lower base than the former.

With proper organization, a trifling sum given by each inhabitant of the State, would provide the funds for both the above great enterprises; and this organization is one of the desirable things we hope shortly to see.

CHAIRS, SETTLES, PEWS, FORMS, STOOLS, AND SEATS GENERALLY.

IT may appear presumptuous to say of so simple and ancient a human convenience, movable or fixed, as a plain wooden chair, that its true principles never have been understood by modern manufacturers, or constructors; although they were approximately ascertained and put in practice by the ancient dwellers in the land of the Nile, yet, such is the case, and the proof will be found below.

Mankind must have learned to sit in the present civilized mode at the creation, the first low, projecting rock, or river bank, suggesting this happy method of ease.

Man is naturally a sitting animal; but his modes of sitting are diverse, and different ones obtain among different individuals of the same nation.

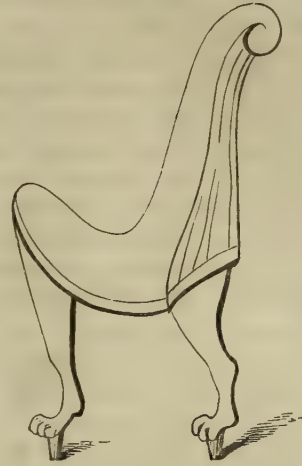
George R. Gliddon used to describe, with great gusto, the impecunious Parisian dandy, as sauntering into a public garden, sitting upon one chair, outstretching both arms upon the backs of two chairs, one placed upon either side, resting his feet upon a chair immediately before him, having on one side of it a separate chair for his hat, and upon the other another chair for his cane, calling for a cigar and a cup of *eau sucrée*, for neither of which were the proprietors

allowed to charge by law, and, being hurriedly served, abusing the waiter like a pick-pocket for not attending more politely to his munificent patronship.

The Moslem Turk, and the Christian tailor alike sit cross-legged; savages in various parts of the world practise various methods of squatting; the European, in society, will sit squarely upon a chair which the untrammelled Yankee will tilt upon its hind legs, to the imminent detriment of the article, unless made in the United States. The same European would cross one ankle over another, or one knee over another, or he might, as a great venture, place ankle on knee. The same Yankee, while perfectly free and apt at all these, would boldly rest his heels upon the seat of another chair, or, to snatch an ease beyond the reach of France, would throw his feet up on the table, the desk, or the mantel-piece. Matrons and maidens, throughout enlightened communities, generally sit with the feet crossed; though there is a vicious practice among girls and the younger women of sitting with one leg drawn up beneath the body. The wandering Arabs, and the modern Copts, the latter the lineal descendants of the ancient Egyptians, sit upon their haunches with their knees drawn up to their chins, a style im-

possible to any one who has not practised it from his earliest boyhood, and therefore not often attainable by Europeans or Americans of the highest culture. This, as the monuments still witness, was the usual mode amongst the body of the people in ancient Egypt. Yet, as the same monuments equally attest, the ancient Egyptians were acquainted with chairs, their sitting gods being constantly depicted upon chair-thrones. Their tombs and temples also demonstrate that the richer classes were accustomed to easy-chairs. The common people are represented either squatting, or sitting cross-legged, on the ground. That wonderful people led, and still lead, the world in many important points; but their gods, although they sat a little more comfortably than our citizens, sat indeed in the same general way; and must occasionally have had the back-ache.

The most hasty reference to that beautiful, clear, conscientious and exhaustive work, the "Manners and Customs of the Ancient Egyptians," by Sir J. Gardiner Wilkinson,* will show their elegant regal fauteuils, or faldistories, painted in the Tombs of the Kings, elaborately carved and colored, and light and strong in make. Even long before the time of the patriarch Joseph, synchronous with the reign of Osirtasen I., about B. C. 1700, the Egyptian carpenters and cabinet-makers had reached such perfection in method and fitting as to do away with the leg braces, depending upon the legs alone for support and security. Their usual height of seat was about the same as at present, namely: the average human knee-joint, although they had some very low, and others with an inclination of the seat, like modern kangaroo chairs. These being in profile with perhaps a relieved edge, rather in the fashion of a low arm and a forward side-curve of the



back conjoined, we cannot tell certainly the exact inclination of seat and back; but there is a very close approximation to the experimental improved form herein advocated. See 1st Series, Vol. II, pages 195 and 382; also Vol. III, p. 170.

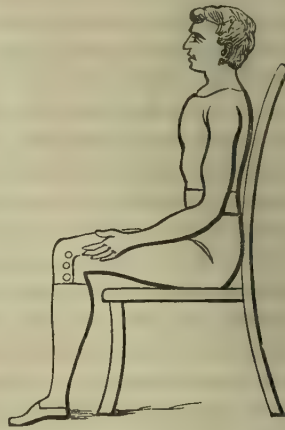
It is a very frequent practice among chair-makers to depress the back part of the seat slightly. So far, good. We find, by instant measurement, however, that an apparently very comfortable-looking, hard-wood frame, cane-bottomed chair has the seat of the same height from the floor, front and back, namely, $17\frac{1}{2}$ inches. Unless as a special piece of furniture for an individual of over six feet in stature, $18\frac{1}{2}$ inches distance from the floor of the upper part of the seat in front would seem to be the extreme limit of height. Close observation of the chairs in rooms where there are many sewing-girls shows that, as a rule, the occupants prefer seats of not exceeding 14 or even 13 inches from the floor, the legs of chairs and stools being invariably found sawn off, so as to reduce their seats to some point between the heights just designated. It might be supposed that this arises from the comparative less average tallness of woman than of man; but it so happens that average-sized men receive quite the same degree of increased satisfaction from these razed chairs as the women do. The true reasons are these: In the

* 1st and 2d Series in 6 vols., 8 vo., 1837 to 1842, 1st Edition, London.

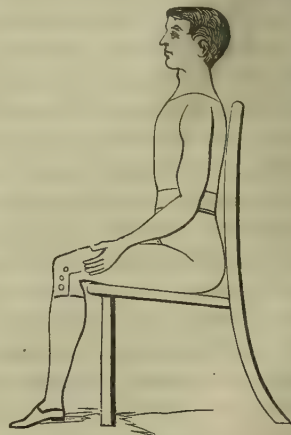
ordinary easy position, assumed in the ordinary high-backed chair, the nape of the neck rests on the top-rail, the shoulder-blades are pressed against the upper middle of the chair-back, the buttocks are deposited in, or nearly in, the middle of the chair-seat, and the inside of the knee-joint is thrown forward from four to eight inches in advance of the front of the chair-seat. This produces an apparently easy, lounging posture,



wherein the body, forming a series of obtuse angles, is obliquely pendent from two main points of support almost at the opposite extremities of the spine. This causes a decided flexure of the spinal column, and has a tendency to strain the loins and crowd the viscera, besides tiring the flexor muscles of the thighs, from the front of the chair having a tendency to cut them. Now, merely cutting down the legs of the chair a few inches is immediately felt by all to be a decided gain in comfort. However, this being done without any idea of the principles involved is only a partial relief. The back is straightened up near the entire line of the chair-back, and is better braced; and the ossa innominata are indeed properly rested; but the thighs are lifted entirely off the chair-seat, and therefore obtain no support. If, while cutting down the back legs of the chair 3 inches, or $3\frac{1}{2}$, the

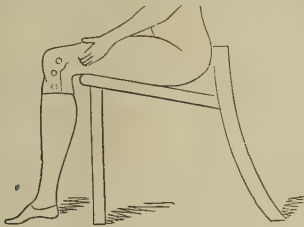


front legs had only been shortened 2 inches, and the back, supposed to be inflexible, and to be hinged at the back part of the chair-seat, could have been thrown forward 1 inch at the top, allowing a perpendicular line from the front of the chair-seat to the floor to be rather shorter than one from the floor to the inner part of the knee-joint, flexed at an angle of ninety degrees, the desired points would be attained; the spinal column would have been kept erect and self-supporting, the chest would have been perfectly free, the haunches would have been braced, the whole under por-



tion of the thighs would have rested upon the chair-seat; and the sitter must have experienced perfect ease. But the chair, not being planned for such angles,

would have been hardly self-supporting, having a tendency to topple over backwards. In manufacturing, this would be obviated by throwing the back legs somewhat further back on the floor than at present, thus adapting them to the resultant strain, and rendering the back more nearly vertical. All this is understood of course to apply mainly to the hard-seat, or the hard-seat with a stuffed cushion, which must be lowered at the same angle about two-thirds the thickness of elastic cushion. Of course the same principles, governing the side profile of such an improved chair, must govern the end profile of porch or piazza settees, church pews, school forms, and all seats with backs. The same inclination of seat to floor should apply to chair-stools and high desk-stools. It is already often found in the latter, though hardly ever in the former. Chair-stools, with small circular seats for momentary rest only, should remain with seats parallel to the horizon. All that is really needed for a good rest, besides the comparative lowness and inclination here insisted upon, is a low perpendicular



back of about six inches height. This will brace the region of the os sacrum; and an erect position is maintained per force. Curiously enough, the ancient Egyptian remains exhibit exactly this very kind of chair, the only exception being that the seat is level and rather high. It is related of Sir Walter Scott's mother, that the Principal of the academy she attended in youth was so strict as never to allow any of the young ladies to rest any portion of the back against a chair-back, and that, as a consequence of this severe training and enforced

habit of her early days, Mrs. Scott, even in her extreme age, would never rest against the back of a chair, always sitting erect, with her back parallel to the chair-back, but without ever touching it. This, no doubt, prolonged her life.

It is manifest from the foregoing, that, although an outcry was made forty years ago concerning high and straight backs in church-pews, as one had long previously been made respecting the same points in domestic chairs, the fault really resided in the high and level seat. And, although, it has also been shown that it is not necessary to make the backs higher than the present fashion, but merely to set them nearly perpendicular, it was likewise demonstrated that it is a vital point to lower and incline the seats.

So much for the wants of adults. Yet, in addition, every household should be provided with miniature chairs of different sizes, intended for infants, children, and youth. All of us have a feeling recollection of the misery endured at church or meeting from the width of the seats of pews or benches, the wrong angles of the backs, and their height above the floor. We could not put our backs against the pew-backs, because the seats were broader than our thighs were long; we could not nestle with our feet on the seats, because that was impolite and unseemly, and, as our legs, too short to touch the floor, dangled down from the seat, and our loose, swinging heels constantly knocked against something, or somebody; there we sat, resembling Mahomet's fabled coffin, suspended by loadstones between heaven and earth, and believing every special discomfort belonged to our special case.

This brings us naturally to crickets, or low wooden cylinders, turned in various patterns, which can be upset and rolled along the floor, carpet-stools, ottomans, stools, and so forth. The three former, as usually made, answer their purpose admirably, and may be dismissed at once. High stools have

already been disposed of. But there is a heavy, low stool needed for attaining quickly, without the cumbrous presence of a step-ladder, a higher part of a room, than the unaided stature can reach. These stools, as at present made, often cause unlucky falls. The true construction is this: For the sake of greater solidity and steadiness, the stuff should be two inches thick. After planing up and squaring your stuff, say to 18 or 20 inches length, and 8 or 9 inches width, take off a rebate on the under side, say a half-inch cross-section, and the same



rebate off the ends. This latter rebating will make your heavy stool look light. Then with bevel square, scribe your sides, so as to form a thorough dove-tail, of the lower part of the leg-



pieces, arranging the lines so that the outer angle of the lower parts, or feet, of the leg-pieces, shall be perpendicularly beneath the end of the stool. When nails are driven through the top into the end-pieces, it will be impossible to take the stool apart, save by splitting the wood into small fragments. Finish by nailing, or screwing on, half-inch sides, fitted in flush as per dotted line.

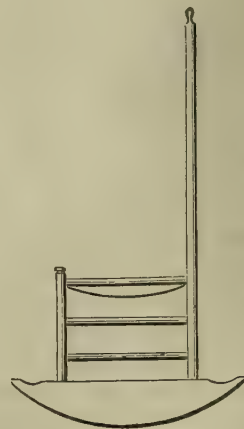


Or, for greater security, another dove-tail could be formed, as per cross-section, and then, after putting in screws, no portion of the stool could ever loosen, or break away from the rest. No mat-

ter when, or how suddenly, weight is placed upon this stool, it cannot possibly uptilt, a very important point in the household, as the head and limbs of its users are safe.

Recurring a little, we have the common wooden rocking-chair, sometimes with cane, or rush bottom, best represented for our purpose by the nursing-chair, without arms.

The omni-prevalent idea is that the rocking-chair is a New England invention; and, while John Bull has, for many years, used it, and praised it, and given brother Jonathan the credit!—so that the writer well remembers an extract from an English newspaper, of the years of his boyhood, surmising that Jonathan would, one day, put all his houses upon rockers, so that the visiting European would be equally edified and amused, by the spectacle of all the dwellings, in a town nid-nodding at one another after dinner, the fact is, that the Yankee only improved the device John himself had originated—amid the fens of Lincolnshire; rocking himself so fast asleep in it, after a grand symposium, under the



shadow of the famous tower of the parish church, in the original town of Boston, as, being carefully taken up, and tucked away in bed,—to have himself forgotten it entirely; forgetting utterly, as well, a few obstinate and perse-

cuted pilgrims, some of rank enough to be known to the fashionable world, and others little better than the vulgar, who brought this chair with them to the bleak northern coast of North America, about where they founded the greater Boston; there finding an indifferent solace in its short and jerking undulations, which must often have reminded them of the nauseating, wavering quiver of their petty ships upon the chopping sea.



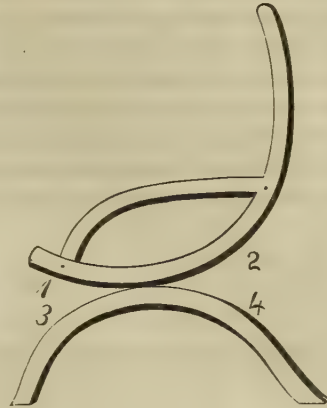
The nursing-chair, as in the margin, is, from its low seat, already eagerly occupied by the first comer. The rockers, being sawed across the grain, have a tendency to crack or break short off; but by lowering the back part of



the seat, an inch or two, and making the back more upright, lengthening the rocker behind, and, prolonging the side-

pieces of the bottom, halving them with the back-pieces, until they fit into the back-tips of the rockers, a much stronger and easier chair is produced.

There yet remains the Yankee seat-rocker, with arms. This consists, in pro-



file, of two equal and concentric segments of a circle, opposed and conjoined in convexity, kept from separating or slipping by two pieces of broad and heavy cross-webbing on each side, running one pair from the front of the bottom to the back of the leg-curve, the other from the front leg-angle to the back of the seat. This is formed of steam-bent pieces, and has stuffed seat and back. It is large, heavy, and cannot upset. It has an extended sweeping undulation, and plenty of room; but when thrown back, the bottom rises much too high in front, so that it requires a muscular effort to depress the seat so as to sit in it. Altogether, except its workmanlike construction, which permits no fracture, every curve being with the grain, it is no improvement upon the ordinary improved American rocking-chair.

The above must be understood of all hard-seat chairs designed *for ease*. Yet that which is easiest to sit in is, from the lowness of the seat, and consequent greater strain upon the knee-joints, hardest to rise from, so that, while the easier pattern will abound in the sitting-

room and nursery, in comfortable homes, for real rest, the common one will remain in use for general purposes.

It must be obvious, as hinted above, that this article can have no great bearing upon easy-chairs of any kind, although their lines of support are not always well chosen, because, being mostly kept low upon their support, their upholstering, more especially when spring-cushioned, enables them to adapt themselves very nearly to the true resting poise of the body. They should all, however, be kept lower than they are at the back of the seat, and straighter

and more upright. But for those who have to sit long at a time, and for days together, easy chairs become particularly uneasy chairs, and very deleterious to the health. Nothing save a hard stuffed leather cushion, or absolute wood, is admissible for the necessarily sedentary, who, through the additional precautions of bending, with a straight back, from the hips, keeping the lungs always distended, and walking two or three miles daily, can keep themselves in good working condition for almost any length of time.

THE PHILADELPHIA PARK EXTENSION AND THE CITY WATER.

MUCH and earnest comment was occasioned in Philadelphia, about sixteen or seventeen months ago, by the water of the Schuylkill, then confessedly ill-tasted and noxious; attributes which, from the experience of generations, we know were not fairly imputable to the river itself, but to the deleterious refuse poured into the stream, for miles above Fairmount dam, by the numerous factories upon both banks. Little was said amongst the people last winter, and, it is believed, nothing in the newspapers; but, in the northern part of the city, the same evils ran their usual crescendo and diminuendo, until the disgust arising from a simple draught of water was nearly equal to the worst of winter before last; and what we know, from reliable informants, to be true of the Twentieth and other wards, is, probably, not unknown in other sections.

Acting upon these and other facts, the Commission for the Extension of Fairmount Park lately presented a very able report to City Councils, which bodies, in all essentials, affirmed the views therein urged, and, as our city

readers will have already seen amongst the news items of the daily papers, sent up to Harrisburg a large and deservedly influential delegation to impress the Legislature with the salient points.

As drawn from the map accompanying the report of the Commissioners of Fairmount Park, the boundary-line of the Park, as now agreed upon, omitting some trivial details, is: Commencing at the southeast angle of Fairmount grounds, corner of Twenty-fifth and Biddle streets; thence westerly along the south line of Fairmount, and across the Wire Bridge, direct to Bridgewater street, along Bridgewater to Haverford, westerly on Haverford to the Junction Railroad connecting the Pennsylvania Central and the Reading Railroads, northwesterly along the curved line of the Junction railroad to Girard avenue; thence westerly to the east line of Fortieth street; thence diagonally and west-northwesterly to Fifty-second street; thence northeasterly to Fifty-first street; thence east-northeasterly to Ford road, between Thirty-eighth and Thirty-ninth streets; thence in the same general course by a more northerly line to the

River road, on the western bank of the Schuylkill, west-northwesterly along the west side of this road to the county-line road; thence across the Schuylkill north-northeasterly along the south bank of the Wissahickon to the Ridge road; thence easterly to School-house lane; thence in a narrow strip, curving with the river, to the northern line of North Laurel Hill; thence merely by the proposed road's width along in front of the cemetery to the south line of South Laurel Hill; thence easterly along Huntingdon street to Ridge road, southeastwardly along the latter to Thirty-third street, southwardly along the last to the Reading Railroad, southeasterly along the railroad to Twenty-fifth street, and southwardly along Twenty-fifth street to the place of beginning.

To many citizens reading the report of the Park Commission, it may seem that full provision has been made for all the wants of the future, and that, what is done now, will not hereafter need amplification. But, while we heartily support both Commission and Councils, on the principle of securing a good thing wherever and whenever possible, and then asking for a better, yet we think they have prospected very moderately for the growing requirements of this future greatest city of North America. The proposition that the city purchase the Wissahickon turnpike and continuous narrow strips of land on both sides of the Wissahickon itself, to the tops of the banks, and somewhat on the level, from its mouth to certainly as far up as Paul's Mill road, at Chestnut Hill, is such absolute common sense that few would risk controverting it. But a similar narrow strip on the west side of the Schuylkill, throughout, and on the east side, so far as practicable, from the mouth of the Wissahickon to Flat-rock Tunnel, or, say Domino lane, should also be secured. In the meeting of Councils Committee of Finance, Water, Surveys, &c., reported February 19, 1868, it was

mentioned that the Commission saw the advantage of taking up more land on the east side of the river, but did not recommend the acquisition of Engel and Wolf's farm,* because it would increase the expense some three or four hundred thousand dollars. Now this estate should really be added to the Park, which will assuredly be found too narrow on the eastern side of the Schuylkill. On the western side, while the dimensions vary from a few perches, at either extremity, to nearly a mile opposite Montgomery street, or the lower end of Peters' Island—forming, in the main, a spacious and compact plot—the eastern, or hither plot, is comparatively rambling and contracted. In preparing for the comfort and delight of many million beings, for all the future, half a million dollars, positively a large sum, is relatively a trifle. Now, the city can bargain elegibly. But let it be proclaimed, "These are definitely the Park limits;" and a few years hence the inevitable enhancement of town lots attendant on the location of the Park itself, will prevent any addition, however desirable. For the same reasons, the western boundary of the Park should run on the line of Fortieth street, from Cumberland street to the county-line road, opposite the mouth of the Wissahickon, thus causing a better finish on that confine, and so join the proposed narrow western strip running up beyond Manayunk. We are the more free to recommend these additions to the extent and cost of the Park because most calculating men admit that the vast increase of taxes, from the consequent rapid augmentation in the value of all the circumjacent property, will, in a few years, render the cost of all the land and improvements an ample source of revenue, instead of, in any degree, a burden.

* This is, we believe, all included in the above dimensions, given not from the Commissioners' Report but from the accompanying map, differently colored for the Park limits from those of the earlier copies, and considerably amplified from the tract recommended in its text.

"But," says the objector, "while we have been shown what to do, we have not been taught how to do it." We, the good people of Philadelphia, are easy and long-suffering. We sometimes obstruct enterprises of great public benefit; and, after opposition has been surmounted, and success is palpable, hug ourselves for our prescience. Witness the city Passenger Railways. We occasionally confer priceless privileges upon corporations for nothing. Witness, again, the city Passenger Railways. Our neighbors, of Baltimore, bear the whole interest on the cost, and all the heavy expense of adorning and keeping up their handsome Park, by a tax upon the respective companies of one cent for every passenger who rides in any of their city passenger cars, and this with the restriction of the fares to not over six cents a trip. We think it is now five cents a trip. But our superior wisdom and facilities compel us to pay seven cents per passage, unless we purchase a number of tickets at once. On this hint we should act. Of course the various charters, as granted, stand for their full terms. Yet, when renewal shall arrive to each, the representatives of the city should see that the above provision is made for all the future. By that time the net five cents per passenger will give the companies a good dividend. Some think that even four cents the head would answer. However, no objection would ever be offered by any Philadelphian to sixteen tickets for a dollar, while he realized that over one-sixth his outlay would inure to the sole benefit of the Park, in other words, of himself; while, as matters now stand, some of these days there will be a shrewd demand for a great reduction of fares. There is the more justice in this proposition, because a large proportion of the income of the companies, directly with many, indirectly with all, proceed, and will greatly more proceed, from the Park.

Thus far the tangible, the material.

But a far stronger argument resides in the conservation of health, by the prevention of the nuisances mentioned in the beginning of this article. Besides, apart from the clearness and purity of the water, to be preserved by sequestering the shores of our charming streams, healthful motion and freshness in the air are always lured along down the valley, from the mountains, by the rippling flow of a well-shaded, running river.

There is one point whereon we differ from the Commission. They speak of having a continuous carriage road immediately upon the banks of the Schuylkill, throughout the Park. But we are confident that a review of this matter upon the principles of landscape-gardening, will show them that, by filling out in the water, thus encroaching upon the width of the river, and carrying this drive along in front of Laurel Hill, they will sadly injure the romantic beauty of its bosky bluffs, now plunging sheer into the flood. Far better let the road leave the stream at, and proceed along, the southern boundary of South Laurel Hill to Ridge avenue, and return to it again, from the latter, along the northern line of North Laurel Hill. In this arrangement, we infer that the present lane from the steamboat landing, between the two divisions of the cemetery to Ridge avenue, will remain open to the public, with a slight meandering change of direction, to become, at no distant time, a beautifully shaded walk, bordered with low, thick hedges, and spanned by an elegant foot-bridge connecting the cemeteries, thus securing them from intrusion, and lined on either side with chaste memorials of the departed. To interfere with the craggy water-front of Laurel Hill, is wantonly to interfere with nature's pet charm of scenery within many miles, is, further, to interfere with the vested rights of the corporation of Laurel Hill, and is, finally, to interfere with the inborn claims of the citizens—lovers of nature. No mere

driving convenience can compensate the narrowing of the Schuylkill here by the contemplated one hundred feet; and the loss of the water now washing the base of these lovely wooded cliffs—a great loss to artistic observers on the opposite shore, but a far greater to the visitors and lot-owners of Laurel Hill—would rudely interfere with the present isolated seclusion befitting the city of the dead.

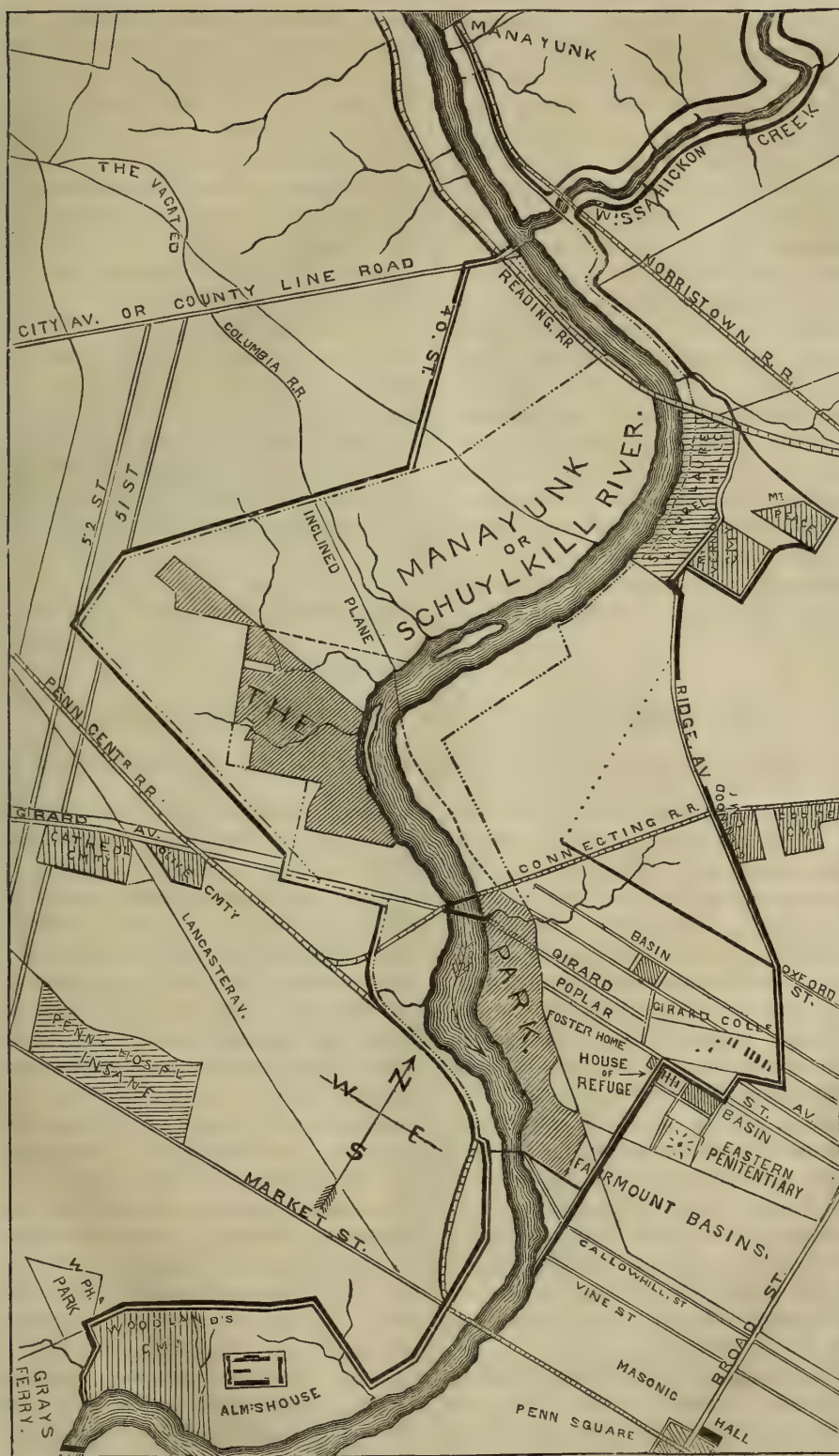
Among the many beautiful dells of the Park is that containing the oval fish-pond, under the high grassy banks, eastward of the Lemon Hill mansion, and across the road from the enclosed spring of mineral water. The ordinary fountain, springing from the pile of rough stones in the centre of this pool, could, by the expenditure of three or four thousand dollars, be replaced by one at once unique, romantic and appropriate. Suppose, as issuing from the under-world, the gigantic granite figure of the Delaware head chief, Tamany, say of about six feet shoulder-breadth, with face toward the east, rising from the waters, so as to display his form, the arms kept close to the sides, as far as the lower part of the breast, with bear-skin over one shoulder, quiver and other accoutrements as their upper portions would proportionately emerge, and his head shaved, after the manner of the sea-board Indians, so as to leave nothing but the slender cord-binding of the crown. The scalp-lock and head-dress—for which see Beverley's account of the American Indians—would be represented by the water, over-curving in every direction, with thin threads tinkling in the lustrous pool. Here would be something, to engage the mind and warm the imagination, never imaged before. In Europe feather-crests upon the helmets of the full-length figures of knights have been represented by water-jets, which, while being a pretty good presentation of the effect desired there, will much better represent this peculiar style of the Indian head-dress.

Hitherto we have spoken of the Park mainly as recommended by the Park Commission, and confirmed and established by the City Councils and the Legislature. But opportunity yet lingers with us to enhance the present high anticipated beauty, and to render it, beyond exception, the noblest municipal pleasure-ground of the United States. The eastern brow of Fairmount-basin knoll is utterly spoiled by a long, high and nearly perpendicular, dangerous stone wall, preventing the development of its eastern slope. This slope requires at least a square for its proper artificial reproduction. Left as now, it must ever be an eye-sore to all observers and a reproach to the city. Extend the grounds here from the southeast angle of Fairmount enclosure, the line of Biddle street, to Twenty-fourth street, along Twenty-fourth street to the easternmost obtuse angle of Girard College enclosure, upon Poplar street, thence eastwardly along Poplar street to Corinthian avenue, and northwardly, on the latter to Girard College gate, thence westwardly, northwardly and eastwardly along Girard College grounds to Ridge avenue, thence along the west side of the latter to Oxford street, thence along the south line of the last-named, until it intersects and merges in the Park, near the southern limit of the Sedgely addition. This tract includes, or encloses, the basin northwest of the College, the Foster Home, the House of Refuge, and the reservoir adjoining, and brings the Eastern Penitentiary within one square of the Park,—a matter of consequence to its prisoners, custodians, and the public, in a sanitary point of view,—and, fortunately, it is but little built upon. Portions of it contain fine groves of lofty trees which, in view of its proximity, it would be a shame to sacrifice to the more earthly gods of brick and mortar, and its surface is such as could readily be converted into a constantly freshening surprise of hill and dell.

The buildings it contains, might, after the proposed purchase, be rented out by the city for a number of years, until it should be held advisable to level them all, and throw into the Park this entire tract. Besides its inherent advantages, all ready for the landscape-gardener, this would, in effect, add the Girard College property to the City Park domain, and perpetually advantage both franchises; it would also grandly bear out Councils' idea of the pressing want of acres upon the east side of the Schuylkill, and appropriately finish Fairmount knoll. The tract here mentioned is of the minimum dimensions. If the city would not regret in future it should also include, as a maximum, the whole irregular triangle between Ridge road from Oxford street to York street, and the limits just described. This is ONE great point. The SECOND is, to surround the new cemeteries in the neighborhood of Laurel Hill, such as Mount Vernon, Mount Peace, &c., with a narrow strip of the Park, thus measurably constituting them a portion of itself, and forever protecting them from the encroachments of the great city. The THIRD is, to purchase a narrow strip of land on both sides of the Wissahickon, from Paul's Mill road—the presumed present northwesterly outer-guard of the Park, in its utmost proposed dimensions—as far as the banks remain high, rocky and picturesque, terminating with the transition into general level meadow, or farm land. The FOURTH is, to purchase and add to the Park all of the right-angled triangle, formed by Biddle street, Twenty-fourth street, and the Schuylkill, not already owned by the city. This will include the gasometer on Callowhill street, and carry the line on the east side of the Schuylkill down as far as Vine street. The FIFTH is, to acquire the narrow tract forming the west shore of the Schuylkill, from Biddle street, on the line of Bridgewater street, fairly to the demesne of the Blockley Almshouse, there being no reason why

the abjectly poor, and, of necessity, the community, should not be guarded through an expanse of verdure and full play of air from the pestilence lurking in the lengthening mud bank, which then would be reclaimed and elevated into the healthful companionship of the Park. Besides, what so gratifying to the tired business-man, from the heart of the city, but dwelling in West Philadelphia, as, on seeing the living green of the whole western shore, to reflect, that far beyond that pleasant scene snugly lies his waiting home. The great thoroughfares of course would all remain open through the Park, as at present, only conforming a little to the line of beauty. As the Woodlands' Cemetery joins the Almshouse boundary, it would virtually be a portion of the Park, which thus would extend nearly to Gray's Ferry, an immense advantage to the future over-crowded city. The SIXTH is, to secure a narrow strip on both sides of the Schuylkill, fairly to Norristown. This latter would give an extended continuous drive of thirty-four miles. Its object would be to preserve the scenery of the river from vulgar desecration, as the Sherman family, buying up both shores for several miles, have preserved West Canada creek, or the Cayoharie, the principal branch of the Mohawk, at Trenton Falls, New York, thus perpetuating the native romantic surroundings of the dark fossil-sprent ravine and its inimitable cascades.

Those who at first start, at the proportions here laid down, must remember that within one generation, thirty-three years, Philadelphia will, in all likelihood, number two and a half million inhabitants. The members of the Park Commission, cool-brained gentlemen, officially predict for it within twenty-five years one million and a half. In a new and free country, population far outstrips the average normal increase. This being the case, it behooves the present public at least to obtain and lay out the ground,



and to plan magnificently. A hundred years hence, and this Park will be only in its infancy. But if we, of this day, allow its borders to be hemmed and cramped, then, in its true proportions, it will never be at all. Its popularly accepted scope embraces every possible manifestation of nature, improved and heightened by art. A matchless field is here. Will Philadelphia circumscribe it? or will she not rather protect its amplest borders, treasure the natural beauties it has retained through all its vicissitudes, and give it genially to present and future surveyors, engineers, architects and landscapists, to be enabled in better times, when zoological and botanical gardens, play-grounds, parades, parks, summer-houses, observatories, water-gates, hedges, fountains, statues, reliefs, monuments, memorials, lodges, orchestras, stairways, miradors,

trees, shrubbery, fruits, flowers, and tame or half-wild living pets abound in, on, or near all its paths and drives, or frequent all its thickets, lawns, crags, waters and woods, to say: "Wonders of this description have, with scarcely an exception, arisen through the exaction of princes from the substance of their people, who were barely tolerated therein. This is the voluntary offering of the people to themselves."

Popularly, the least appreciable, yet really the strongest of all the bases of argument upon the score of utility, remains untouched. It is this: that which uses the discoveries of art, thus heightening the charms of nature, to gratify the senses and the mind of man, just as surely gratifies and purifies the soul, inciting it to

"Look through nature up to nature's God."

THE REMOVAL OF THE NATIONAL CAPITAL, THE CAPITOL, AND OTHER PUBLIC BUILDINGS,

IS a matter which has often been bruited, and lately in the House of Representatives by General Logan, who favors some point in the valley of the Mississippi. He is said to be in possession of facts and figures, prepared by the ablest architects in the country, giving the aggregate cost of moving the principal buildings to any designated point on the great river. One of these professional gentlemen says, that ten millions will be ample to take down, remove and rebuild the principal edifices now in Washington, D. C., namely, the Capitol, Treasury Building, Patent Office, and Post Office. It is understood, that any one of the Western States, within whose borders the Capital may be located, will give the land and incur all the expenses.

Polity only acting upon mankind in the mass, no possible system of government creates personal purity; working upon and improving mankind in the in-

dividual, Christianity alone can do that. Therefore we cannot fairly be charged with venturing beyond our scope when we say, that towns existing simply as seats of government, all whose inhabitants depend, some way or other, upon office-holders, transient or permanent, are not apt to rate so high in general, public or private morality, as those which have grown up from an assured support in commanding position and the wants of a large surrounding community. We wish that Washington, the city, were as pure as its projector, Washington, the man; but we would be the most unsophisticated of Americans, to hint such a resemblance. Many of the best of the land are often there, but pretty much all the worst are generally certain to be. The residents are most, at fault in giving little, and charging much. The sojourners, if political manipulators, scarcely find any of their class better than themselves, and the

fear of ridicule, among associates, has a rapid tendency to make any particular soul worse, compared with former and present self. All this experienced, conversant, or incipient wickedness, is referred by those who practise it to the entire multitude of the city, and many individuals belonging to that city are not loth to do what they are accused of. Far different is it, in a large self-sustaining city. The officials may be in it, but they are not of it. Its citizens are profitably busy with their own concerns, and live not upon lobbying, or its fruits. Good reputation in it depends upon quite another character than inordinate office-seeking implies, so that its people will not corrupt, and may improve the strangers abiding among them. Its life may be fostered by good policy, but evil policy injures it only after long periods of misrule, when said policy has hopelessly corrupted the whole commonwealth by continuous and glaring breaches of public good faith, which ultimately sap private honor.

Hence, until the better days surely to arrive, when good shall rule politics, as some little town would be vitiated, or some un-urbaned locality would be degraded, we say, let bad enough alone where it is, and some day it may be altered to well enough. At any rate, do not smirch a new neighborhood with the old stain.

Legislators must, however, do something, or they will have no subsequent terms, and not be able to rise in their vocation. Yet it is a very nice problem to do any thing when nothing needs an act. Still, rather than do nought, many will do mischief, as the good people of this land have learned to their cost. In this we refer not to the present mover, who really represents a pervading sentiment of his section, and one which has possessed it long.

There is great ado about centrality with those who wish to effect the removal; but, since the introduction of steam-railroads, and electro-magnetic

telegraphs, that is really not worth considering. Given the completion of the Central Pacific Railroad, and San Francisco is nearer the seat of government than Pittsburgh was sixty years ago. Time then, cannot enter into the question, distance is rendered easy to the honorable members' pockets by mileage, and a little fatigue should not be avoided by any ambitious of serving the republic. The true central point for our era is the Atlantic sea-board, in the neighborhood of the fortieth parallel of north latitude. Whether for the operations of peace or war, this, *for us*, is the nearest practicable centre of the civilized world. The present course of trade, and, consequently of exchange, is ruled in Europe, and towards Europe must we look. The nearer we are to Europe therefore, the more quickly can we seize advantages, the more closely scan dangers, news being used in a thousand quarters before it has fairly quitted the vessel. Even when the course of trade shall veer from Asia, through Europe, to North America, its present channel, to its certain future one, within the next few generations, from Asia, through North America, to Europe, leaving its choicer profits in the northern half of the new world, it will not demand a territorially central metropolis, but one attached to, or near, the most practicable port in the median line of the Pacific coast, in other words, San Francisco.

Until, however, the great change occurs, the Capital is not far from the right spot. If the sheer sectional renown, not to say personal advantage, of Western Congressmen must be gratified, then by all means let the Capital go to St. Louis, as the chief central city on our great inland water-course, although the exigency does not demand it.

For the good of the nation, not by any means the advantage of the city—as while we would certainly purify the public offices, and perhaps their incumbents, though as certainly losing by the contact; and thus Philadelphia's future

clearness would be clouded, as the transparent waters of the Mississippi after receiving the turbid flood of the Missouri—the Capital had better return here. In times long gone by, we justly lost it by parsimoniousness, having been out-bidden in the offer of land by Maryland and Virginia; or rather, we believe, having refused to give any land at all; but Philadelphia is the birth-place, the bulwark and the natural Capital of the Republic, and holds the position best adapted to the combined wants of commerce, manufactures, and government. London is sixty miles from the sea; Paris, as the crow flies, one hundred and fifteen, with the disadvantage of a much longer voyage by its narrow, crooked river; so that while London is its own port, Paris requires Havre in that capacity. Philadelphia, by the windings of the Delaware, a much finer stream than the Thames, is only fifty miles from the ample, open bay, and but a hundred from the open ocean. We would not admit the assembled wisdom of the nation within the built portion of the city, but provide a grand locality out on some of the hills of the Schuylkill, or the Wissahickon, in the immediate neighborhood of the great Park, that is to be. And when the Capitol shall be re-erected, there will arise a fitting opportunity of making its centre, now of friable, dirty, whitish-gray sandstone painted white, of white marble, the same as are its much finer wings. Now it does not typify either the founders or the progress of the nation properly. As the founders were greater men and better men than any public generation of their successors, the main building should have, if any difference, better material and finer ornament than the wings, at all events it should not compare unfavorably with them; and its grounds should be healthy, spacious, adapted to the necessary accompanying public buildings, full of natural variety and picturesque beauty, and heightened with all the appliances of high art. The natu-

ral we have, the artificial we can procure; and it is to be supposed that the commonwealths of the East, at this alert age of the world, will be at least as generous, at least as full of forecast, as those of the West.

Should the Capital come, nay, return, hither, so much the better for the Capital, so much the worse for ourselves. We neither need, nor want it. This article has merely been evoked by the desire for an exposition of the fitness of things. What we say of Philadelphia we believe to be true; if true, her predominance will be manifested in the fulness of the future, and will be all the same, whether she shall or shall not be the titular Capital of the United States.

To all intents and purposes the Capital at Washington is about the same as if at Philadelphia or New York; and whilst assuredly no patriotic New Yorker would patiently listen one instant to the claims herein set up for Philadelphia, he would surely maintain that the "great cosmopolitan metropolis" and the "overgrown provincial village" combined, are, in every essential thing, the two hubs of the universe on one side of the axle, with their circumferences everywhere; and that Boston, the previous conscious hub, and Baltimore, which would like to be one,—both of them young little giants, by no means arrived at their full growth,—are merely two very snug wheels within these other wheels.

At the same time, in view of the inevitable, sketched in these paragraphs, we recommend that the Capitol and the Capital remain quietly where they are; and that, instead of the White House, a new and stately Presidential Mansion be built far away from the autumnal miasma of that reach of the Potomac now graced by the modest home of the Executive. Above all things, let us make no move, if possible, at least, no distant move, until the wealth of Asia sweeps hither across the Pacific ocean and the far western plains.

VENTILATION AND HEATING.

BY LEWIS W. LEEDS.*

THESE bear much the same relation to a building that the lungs and blood-vessels do to the human body.

You may chisel from the solid marble an elegant statue of a man, perfectly formed and well proportioned in every respect, yet that is not much of a real man after all, no matter whether it does cost a great deal of money.

So with a building it matters not how elegant and comely you make the exterior proportions, nor how strong and substantial you make the interior, if you neglect to secure for it a constant supply of pure air and provide for a comfortable warmth in winter, it is a mere graven image of what you want; it lacks the essentials of the life and vigor of the real man. To make the necessary arrangements for the thorough and economical ventilation and the comfortable warming of many buildings frequently requires much careful study.

It must be done, however, and it is the Architect's business to do it, and he will soon find it to his interest to do it thoroughly.

The styles of dwellings are changing so rapidly, as well as the manner of their occupation, that it constantly requires individual study to meet satisfactorily these ever varying changes. A thorough familiarity, however, with the leading principles, is the great essential.

The impression is rapidly gaining ground, that it is necessary to make a special provision for the supply of fresh air to every pair of lungs; that it will not do to trust this to a mere accident, any more than it does, to trust the much less important matter of supplying the body with food. To be sure, Nature would supply the air, if Art did not interfere with the action of her laws.

This point gained, have the people

learned that they must pay their money to secure this lung food? Scarcely. This is just the point they are now studying. Some few have already begun to comprehend it, but more cannot understand why they should have to waste their valuable dollars and cents on any thing as cheap and abundant as air. They scarcely comprehend the reality of air; that a very small bulk weighs a ton; and that it requires a positive power of some kind to move a ton of air as well as a ton of water; and that, if they require it moved artificially through their artificially-constructed houses, they must supply sufficient power to overcome the great natural laws of motion. They are learning this very rapidly, however; and, as Architects are so especially concerned in this new demand of an enlightened public, they should lose no time in making themselves familiar with all the details. They will soon find that it is an almost unexplored wilderness; that the few guide-posts which they may discover are like the names on the street lamps, liable to have been turned round, and just as likely to point the wrong way as the right. So they had better be sure they start on the right foundation; and build their own superstructure with care.

Owing to the fact that we cannot see air and have no ready means of detecting the impurities that may contaminate it, a higher order of intellect and a keener imagination are necessary, to comprehend fully all the points bearing upon the subject.

I think one of the simplest ways of realizing the motions of air, of different densities or temperatures, is, to use a glass-house filled with water; as the laws governing the circulation of liquids are so similar to those of gases, that the

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illustration is quite perfect. I wish this manner of illustration could be more frequently resorted to.

In heating, the primary and most essential point is, to keep the feet warmer than the head. We have as yet paid but little attention to this; but it is really the very foundation of the subject of heating; and I think much attention ought to be given to the endeavor to modify the manner of constructing our buildings, so as to secure this end, physiologically so important.

The proper distribution of the heat on the cold sides of the room, instead of in the centre, as is too often the case, is a point of much practical importance. I think it has been very fairly demonstrated that we cannot have a comfortable, vigorous atmosphere in a room, where all the air is heated hotter than required for breathing.

Therefore no furnace, steam, or even hot-water apparatus, can warm a room satisfactorily by being placed in a chamber outside of the room, warming a current of air passed over it, and introduced into said room; but there must always be some direct radiation, from surfaces exposed directly in a room, and

hotter than the required temperature thereof.

But much care must be taken not to adopt the other extreme of depending exclusively on direct radiation without the proper supply of partially-warmed air. The combination of direct radiation and a circulation of warmed air is therefore the best.

To fill hollow walls with warmed air is a splendid arrangement for giving off a mild radiant heat.

If we could keep all exterior walls warmed to say about 98°, or the temperature of the body, and the floor the same, with extra heaters or radiators of some kind under the windows, to counteract the excessive cooling at that point, we should soon find that the vexed question of Ventilation would be more than two-thirds solved already. The doors and windows would then be left open more freely; and the halls, stairways, and open fire-places, which are the great natural ventilators, would then act a valuable part in maintaining that general circulation, so important to supply all the inmates of a building with food for the lungs.

More, and at greater length, anon.

AMERICAN AND FOREIGN WOODS.

BY GEORGE J. HENKELS.*

INTRODUCTION.

THE semi-continent of America, and the adjacent islands, produce the best woods for all mechanical purposes, and the most beautiful for ornamental use; and the whole civilized world depends on them for its principal supply. The softer woods, such as Pine, Spruce, Hemlock, Poplar, Ash, Cherry, Oak, Maple and Walnut, are indigenous to the whole of North America. The hard woods, such as *Lignum-Vitæ*, *Cocoa*,

Ebony, Rosewood, Satin-Wood, Mahogany, and numerous other varieties, unknown in the mechanic arts, (and which, so far as tested, are of but little use for any purpose,) are all found in South America and in the islands of St. Domingo, Cuba and Porto-Rico. In the States bordering on the Mexican Gulf, north of the Isthmus, there are some inferior varieties of the hard woods; but, with the exception of what is called Mexican Mahogany, there is nothing of any importance to the rest of the world.

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For the construction of houses and of cabinet-ware, most of the above-named woods are well adapted in utility, durability and beauty.

The Pine and its varieties are so familiar to us all, that we do not properly appreciate this great national endowment. Commencing with the most inferior of this genus, the Hemlock, we find its great utility in furnishing us with cheap joists for small houses. Next, the Spruce, which is very elastic and durable, produces the best joists for large buildings, better than Oak, as it will last fully as long, is much easier to work, and does not warp so much. It is equally strong with ordinary Black Oak; and, not being so heavy, is better adapted for extensive edifices. The next is White Pine, the wood of all woods for general purposes; and is bountifully distributed by Providence almost all over the whole continent. It is so very plentiful, that we are wasting it shamefully, without making any preparations to maintain or restore the supply, and no doubt we will continue this prodigal waste, until the difficulty of obtaining it so enhances the price, that we will be compelled to be more economical in its use. It is cut to all sizes, for all purposes in building; and is used for doors, sash, mouldings, facings, shingles, weather-boarding and packing-boxes. It is the easiest to work of all known woods, and is of more practical use in the mechanic arts, than all other woods combined.

Yellow Pine is the hardest of the genus. It is found in best perfection in North and South Carolina, Georgia and Florida. As is the case in all other woods, so with this, the nearer the tropics the harder the wood. Fat Pine is not found north of Virginia; but in New Jersey, and in some sections of Pennsylvania, there is a hard-grained wood, somewhat resembling it, used for cheap flooring, wainscoting and weather-boarding, particularly in Jersey; and in constructing the schooners and sloops that

are built so profusely along the Jersey coast. The Yellow Pine also is a great benefactor to the human race. It produces from its sap turpentine, rosin, pitch and tar, and is of prime utility for masts of the largest ships—also for ship-timbers and deck-flooring. It is almost indispensable for floor-boards, and is the very best wood for all interior work in good houses; its great durability arises from the fact, that it is so impregnated with the resin, that it at once affiliates with the turpentine in the paint, and holds the latter very firmly. This at first may not seem a matter of much importance; but we know, from long experience, that such is the case, and can likewise adduce analogous facts. For instance, in using varnishes that are made from resinous gums, we find it very difficult to make a coat of shellac varnish take hold on a coat of copal, or *vice versa*—whilst we can put coat after coat of either kind on the top of another, and they will all affiliate, and become a solid mass. The turpentine in the paint will mix with the resin of the wood from which it is derived. The writer was forced to this conclusion, on examining the paint of a house built thirty years before, which was being torn down, and in which all of the wood, even to the stud-ding, was Fat Pine, whose paint was in good preservation, with no disposition to blister. Fat Pine is really a beautifully-grained wood; and when made into furniture, and finished with shellac varnish, it is much more beautiful than Oak, and equal in appearance to Satin-Wood. For finishing the interior of dining-rooms, for doors, wash-boards, wainscoting, window-frames and sash, it is much more beautiful than Ash, not near so gloomy-looking as Walnut, and will not wear dirty in color, as all other light-colored woods do.

To cabinet and chair-makers, Poplar is a very serviceable wood, but is not of much utility to builders. The soft Yellow Poplar, such as is used for wood-

seat settees and chairs, and by cabinet-makers for drawer-sides and bottoms, comes from the Northern Lake shores, by way of Albany, New York, which is the great distributing point. There are several varieties of indigenous Poplar, all of which bear the tulip-shaped blossom; and, as before remarked, in general the farther South it grows, the harder the wood. What is called Hickory-Poplar is very tough to work, and is very elastic. It is used, almost exclusively, for fine carriage-bodies. Its durability is exemplified to all, when it is known, that the most expensive and finely-finished carriages are made of this wood.

Ash is found in several varieties. What is called White Ash is most favorably known. The aborigines of this country used the young White Ash for their bows, it being the most elastic and quickest of spring of all our native woods. It is of great utility to wagon-builders, as most of the felloes of heavy cart, dray and wagon-wheels are made of it. Cabinet and chair-makers use the soft, or upland Ash for frames of chairs, seats and sofas, as it holds the tacks well. Black Ash is scarce, and hardly known, as such, to mechanics.

Cherry is a very firm, close-grained wood, and it admits a fine polish. It grows to immense size in the interior of Pennsylvania. This is not the same as the Domestic Cherry, although of the same nature. It is used principally in making agricultural implements, cheap dining tables and chairs. Before the universal introduction of Walnut for furniture, it was much used in connection with mahogany, as the grain is similar; and ground terracina, or terradi-sienna, in oil, coated lightly on this wood, makes a good imitation of St. Domingo Mahogany. At present there is very little demand for this wood.

Oak grows, in great variety, on the whole continent of North America. White Oak is used by builders of heavy wagons, by carpenters, for joists, and,

in fact, for almost all mechanical purposes. The Brash Oak, which is best for furniture, comes from the Lake shores. Red and Black Oak are very similar, and are principally used for large brewing and other vats, and for barrels of all kinds, whether for solids or fluids. Oak also produces most of the bark used for tanning. Its bark contains the most active and valuable principle of tannin. The foreign demand for this bark is so great, that our State was compelled to pass severe laws, to prevent its adulteration with other and cheaper bark; and the office of Bark Inspector for the port of Philadelphia is quite a lucrative one. Live Oak grows in the Southern States of the Union, and is most valuable for ship-knees and timbers. The United States Government has large reservations of timber lands of this wood, especially for navy vessels. The other varieties, such as Chesnut-Oak, Pin-Oak and Scrub-Oak, are not of much use.

We will mention a singular fact, in regard to what is called Scrub-Oak. Wherever Pine timber is cut off, or burnt out, of any tract, the Scrub-Oak immediately and invariably shows itself, although not a shrub of it had ever appeared there before; and it grows and flourishes, until the Pine again grows up, and overshadows it, when it disappears, only to renew itself under the same circumstances. It is inexplicable how the germ of this Oak remains in the ground for centuries, without fructifying, as it grows from the acorn only. Why should it appear only in ground previously occupied by the Pine? Such, however, is the absolute fact.

Maple is indigenous to this country only. There are several varieties of great use in the mechanic arts, and some for domestic purposes. The plain White Maple, Curled and Bird's-Eye, are what are known to mechanics. These varieties are in much demand in Europe, for furniture, on account of their great beauty. The French cabinet-makers

dye them in every color, and afterwards make the most beautiful table-tops, by inlaying the different colored bits of these woods, so as to form flowers, animals, and landscapes. This art is brought to great perfection. If Maple were an expensive foreign wood, it would, no doubt, be a great favorite with us for fine chamber furniture, but being not an exotic, but only a familiar native, we do not appreciate it; and our people go to Europe, and buy elegant *Marquetrie* tables and cabinets at immense prices, not knowing that the beautiful colored wood that forms the marvellous inlaid panels, or the choice table-top,

even to the Ebony, is (at home) our own unassuming but beautiful Maple. Like our other woods, the Maple is fast disappearing, from ignorant waste. The Sugar Maple is being preserved, from the fact that it is profitable for its sap, of which they make sugar in New York and the New England States. The Maple, which is planted for shade and ornament in the cities, is of no use to mechanics, as it does not grow to any available size.

In another article, we shall describe the woods, both native and foreign, which are used for furniture, and so we end this preliminary glance.

STAINED GLASS.

By JOHN GIBSON.*

GLASS of the various kinds, white and colored, plain and ornamental, is so intimately connected with architecture and building, that a short description of its origin, history, and uses may not be uninteresting to the readers of this Journal; not that much new can be said on so old a subject, its origin being of such antiquity that but little is known of its first discovery. Pliny, the Roman historian, relates what is supposed to be the origin. A ship laden with fossil alkali, having been driven ashore on the coast of Palestine, the sailors placed their cooking vessels on pieces of the alkali and lighting fires on the sand, the heat fused the alkali, which combining with the sand the result was a species of glass; and thus accident led to its discovery as an art.† There are other conjectures, such as the burning of bricks, which are more or less covered

with a glazed coating if over-burnt and vitrified, which might originate the idea and lead to its discovery. It also may have originated from necessity, which, after all, is the great mother of invention in the arts and sciences: the necessity of a medium of admitting light and keeping out the storms from their dwellings may have been the incentive to devise a substance, which, after many failures, produced glass. Whatever may have been the cause, its history is of such remote antiquity, as to be lost in the obscurity of time. In sacred history we read of the crystal and a molten looking-glass; and in one of the Egyptian Tombs is the representation of workmen engaged in glass-blowing, very little different from the mode of the present day, which is a proof that the ancient Egyptians were masters of the art.

The origin of the art of coloring glass is also lost to us, owing to its antiquity, but, no doubt this was discovered soon after the making of glass; for as is natural to man, after a necessity has been sup-

† As to nature's glass, we have pitchstone, olivine or chrysolite, obsidian, angite or pyroxene, leucite, and especially quartz, with its many varieties, massive crystal, rock crystal, flint, sard, amethyst, chrysoprase, cacholong, chalcedony, carnelian, onyx, jasper, and agate; and nature's glass-houses are the volcanoes.

* J. & G. H. Gibson, Stained Glass Manufacturers, No. 125 S. Eleventh street, Philadelphia.

plied, he is not satisfied until he makes the article supplying it ornamental. The ancient authors, who have written on the subject, record the fact, that color was mixed with glass to imitate gems. Glass beads, and other ornaments, numerous specimens of which have been found adorning the bodies of Egyptian Mummies, have been exhumed, and found perfect, after a lapse of at least 3,500 years. But it was not till after the commencement of the Christian era, that it appears to have been used in windows in its colored state. Leo the III. is said to have adorned the windows of the Lateran with colored glass.

After the making of the colored panes of glass, it naturally followed that the artists of that day would combine them in various ways to produce variety of form and design; at first, with the simple colors red or ruby, blue or azure, yellow or golden, which are the three primitives, each beautiful in itself, and the three, in combination, producing all other colors.

And here, to digress a little, there is something wonderful in the analogy of the number three: Father, Son and Spirit; Sun, Moon and Stars; Faith, Hope and Charity; Earth, Air and Water; and the three colors, Red, Blue and Yellow, from which all other colors are produced, for white is the absence of color, from its entire reflection of all three primitives, as black is the shadow or combination, from its complete absorption, of the three. The mixture red and blue producing purple and violet; the red and yellow, orange and scarlet; the blue and yellow, green; and so on, *ad infinitum*, until you have all the colors of nature in all their various hues.

The most ancient windows were very simple, being, in fact, pieces of colored glass joined together with leaden bands, making a sort of mosaic pattern, which in proper combination produces a very brilliant effect, but, from its intensity, is too overpowering, when the sun shines

upon it, to be looked at for any length of time with pleasure, as it dazzles and confuses the eye. This undoubtedly led to the combination of the plain colors with enamel, which is put on the surface of the other glass and fused into it, and, by softening the brilliancy, produces an effect on which the eye can rest longer and with more pleasure. Having attained this, we gradually get to the admixture of color with enamel; and so produce pictures of the most beautiful kind. This idea was said to have been first suggested by a French painter at Rome, but the first specimens of the combined art are said to have been executed by Alfred Durer, an architect, an engraver, and a painter of the first celebrity, whose works stand to this day, giving proof of their enduring qualities and beauty. The writer had the pleasure of examining some of his finest work, in some of the windows of the grand Cathedral at Cologne, which, for beauty of design, boldness of outline, and harmony of color, are not excelled by any in Europe, ancient or modern; indeed the modern windows in the same Cathedral, by the best masters of Munich, look tame and flat beside them. This is not prejudice, for it was not till some time after I had been admiring them, that I discovered who the artist was that made them.

Here let me say, that the art of glass-painting takes rank among the very highest. It is one which the masters of the olden time did not disdain to follow. That it is more difficult than high art upon canvas, or any of the usual materials, none acquainted with the process will deny, for when the colors are applied, the chemical judgment and practice of the artist must be great, to enable him to know what will be the result of his labors, when put through the furnace; as, until they are fused, the colors are not produced, and a shade too heavy may destroy the beauty and harmony of the whole design.

And now, the question arises, Can the

artist of the present day, produce stained glass equal to the ancient? The art was said to have been lost. This I believe to have been a mistake, although, no doubt, it fell into disuse for nearly four centuries, yet we have records of various artists, who now and again would be employed, principally in restoring the cathedrals and churches; and sometimes with very poor results. Still it shows the art was not wholly lost, though it is only in the present century that its revival has been a marked success. And, in the early part of the century, hard indeed labored the lover of the art. And he must be, not only a lover, but an enthusiast in the art, to attain any celebrity. He must spend his days and nights with his books and his crucible, seeking into the hidden secrets—melting his gold for purples, his silver for ruby, his cobalt for blue, and so on; for the

art, although not entirely lost, has still, in some of its parts, to be mastered. Such was the task of the rediscovering artist in the beginning of this century, to the writer's personal knowledge.

There is much to be said about the gorgeous effect of the ancient windows; and this all will acknowledge who have had the pleasure of looking upon them; but a great deal of this has been produced by old Father Time, acting on the outer surface of the glass, which latter, being in fact not so well manufactured as the modern glass, has become corroded and full of small holes, which, being filled up with the dust of ages, give a sparkling brilliancy to the parts that are left clear and clean.

We will discuss the cause of the want of success of modern work, in a future communication, which we trust may be instructive and useful.

PLUMBAGO MINES OF CANADA.—In Canada, the production of plumbago, for the purpose of employment in the various arts and manufactures in which it is so extensively used, has already made considerable progress. Several associations, on an extensive scale, are in operation in the county of Ottawa; and it is probable that many others will be set on foot in the course of the ensuing season. The extent of the plumbaginous deposits in the crystalline rocks of this part of the province is ascertained to be very large; and there can be little room to doubt the means of profitably working them. From the facility with which these beds may be worked, and their large area, it is probable they will eventually form the chief mining field. They, in all cases, offer a difficulty in the calcareous mineral which they comprehend, and which is not easily separable. Some samples of this plumbago, however, have been prepared, and

after being subjected to the severest tests, have proved perfectly satisfactory; so that a stimulus has been given to enterprise in this direction, which will undoubtedly result in great advantage to the country. Plumbago is used to an extent not generally known; and its employment must be largely increased by even a small reduction in its cost. In New York and Boston alone, it is said, upwards of ten thousand tons are annually imported for the manufactories of New England. Hitherto, these supplies have come in great part from Germany and Ceylon. For the future, Canada may very well look forward to these markets as her own. It requires only economical arrangements for mining on a considerable scale, and some improvement in the processes for freeing the plumbago from its impurities, to render this one of the most important of the mineral productions which the Province possesses.

FIRE-PROOF CONSTRUCTION.

JOSEPH GILBERT'S PATENT CORRUGATED IRON CEILING, FOR RENDERING BUILDINGS FIRE-PROOF.

THE increased cost of erecting structures of every kind, with the serious nature of the large fires throughout the country, has naturally attracted the attention of the community to the importance and absolute necessity of constructing Fire-proof Buildings, with a view to avert the progress of the devouring element; to adopt measures for the better security of property, and to prevent a calamity so injurious to public and individual interests. The capitalist, the mechanic, the philanthropist, in fact all classes, are to a certain extent interested in this matter. In many instances, the parties most affected (peculiarly) allow themselves to remain satisfied with a knowledge of the fact that they are insured, not taking into consideration that although they may be fully reimbursed in event of loss by fire, they would be vastly better off had such a misfortune not occurred, for various reasons: among which we would mention that their trade would not be diverted from its regular course, that their skilled employes would not be compelled to seek other employers, and that they would not be subjected to many other annoyances arising in consequence of such a calamity. Besides, whatever aggregate destruction is occasioned by a fire, that much of the concrete result of human skill, time, and labor, is lost to the world forever. In Europe more attention has been paid to rendering buildings fire-proof than in this country. The Fire Departments in European cities are small affairs in comparison with those of our American cities, yet there are few destructive fires in Europe, and why? The municipal regulations there are such, that all large buildings are constructed with the view of being as nearly as possible impervious to the inroads of fire. Were

more attention given to the construction of fire-proof buildings in this country, the cost of our Fire Departments would be reduced to a sum merely nominal, and the rates of insurance would be materially lessened as a natural consequence, with other beneficial results to both the insurers and insured. That it is necessary to guard against fire in all commercial cities, and throughout the country, no one can dispute, and no building of any magnitude in the United States should be erected without being made fire-proof; great conflagrations which have devastated whole sections of our large cities, and the great losses thereby sustained, prove this. The preservation of public records all over the country is sadly neglected, and should not longer remain at the mercy of the elements. The business community have of late awakened to the necessity of erecting fire-proof buildings, when it can be done with economy; heretofore, the drawback with our builders has been the great expense attending their construction; heavy iron beams and ponderous brick arches have always been objectionable on account of their great weight, and various methods have been devised to substitute iron arches for brick.

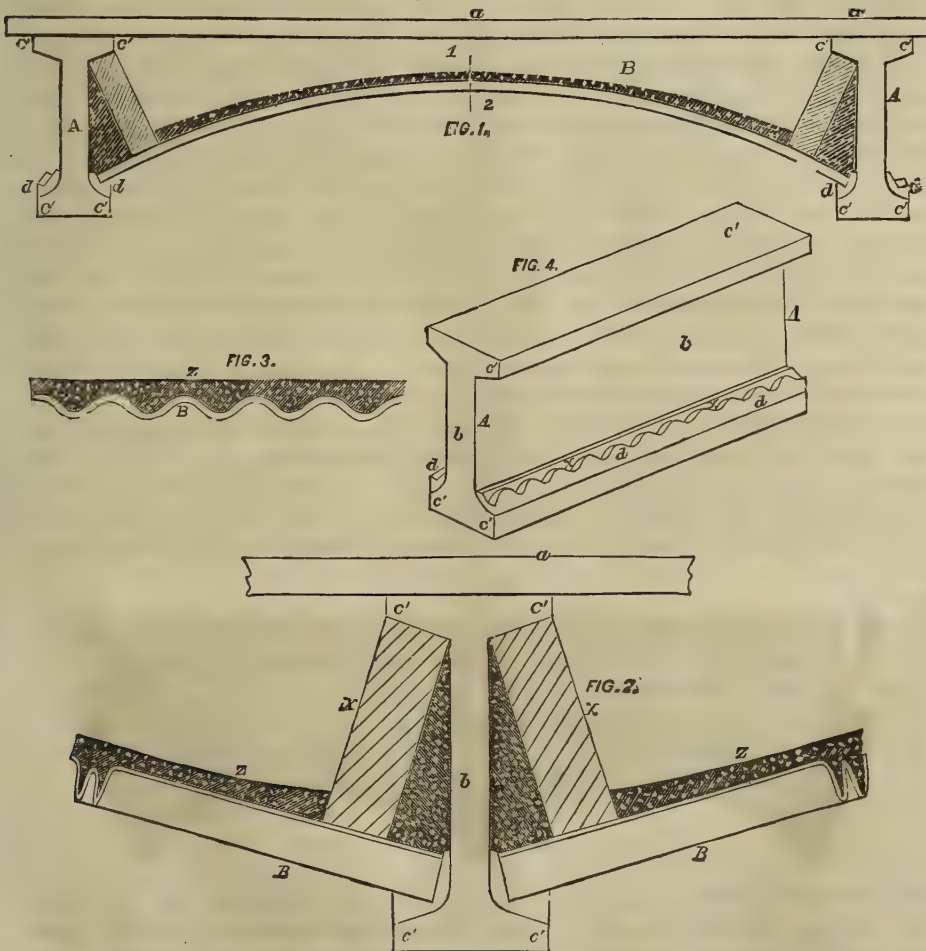
All progressives who have examined into the merits of the Gilbert Patent Corrugated Iron Arched Ceiling, are convinced that the advantages peculiar to its construction are such as to entitle it to more than ordinary consideration, as it will be found a floor of exceedingly light construction, perfectly fire-proof, and containing all the elements of strength and rigidity which can possibly be attained. This very complete and valuable ceiling (or floor) was invented by Joseph Gilbert, practical builder, of Philadelphia, and letters patent granted May 14th, 1867, and by

reissue Nov. 5th, 1867. It has been thoroughly examined by the principal architects and engineers of this and other cities, who are satisfied that it exceeds in every respect any thing of the kind heretofore produced, and that it is a valuable invention, which, combining durability, economy, strength and lightness, recommends itself to the attention of all architects and builders. The Committee of Science and Arts of the Franklin Institute of Pennsylvania, appointed a special committee, consisting of some of our leading scientific men, to examine into its merits; their report will be found below.

The following advantages of the Iron Ceiling must be taken into consideration:

It takes one-half the weight from the walls of the building. It takes one-half the weight from the iron beams, therefore the beams can be of less weight, or there may be a greater space between them. It costs less on the average than the brick arches, and saves the tie-rods and the plastering. There is no lateral pressure. The ceilings are higher with the same amount of brick work. The iron ceiling is more ornamental than the plain brick arches. By placing the iron ceiling in at the same time the iron beams are placed on the walls, the building is strengthened. The iron ceiling gives a scaffolding over each story, which will enable the builder to finish any work in the basement.

Can be shipped to any point desired.



DESCRIPTION

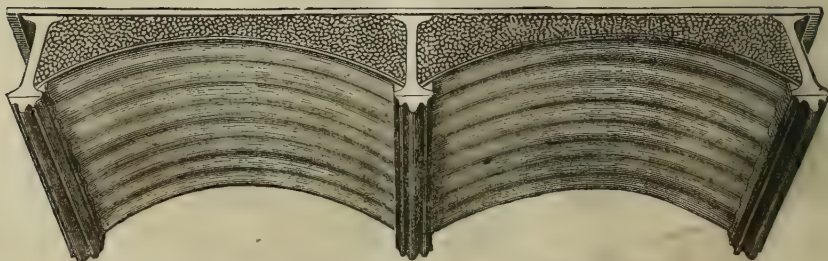
This invention consists of a ceiling composed of (\equiv) girders, corrugated arched plates resting on certain socket-bearers, the whole forming a light, cheap and ornamental fire-proof ceiling.

FIG. 1 shows an elevation of part of this ceiling. FIG. 2 is a detached sectional view of the same, drawn to an enlarged scale. FIG. 3 is a section on line. $\frac{1}{2}$ FIG. 1 and FIG. 4 are perspective views of a girder and socket (C C). (A A) are two of a series of parallel girders of ordinary (\equiv) iron, the opposite ends of which project into the walls of a building, and on these girders rests the floor (A). On each of the lower flanges (C) of each girder, and against the vertical portion (B) rests a bearer (D), which has a corrugated recess or socket (X) at one side, for the reception of one end of the corrugated iron plate (B); the latter being arched, as shown in the drawing, and resting at its opposite ends in a socket or recess of a similar bearer (D) fitting on the flanges, and against the vertical portion of the adjacent girder. Against the sides of the upper flanges (C) of each girder-bearer, are the upper ends of inclined bricks or blocks (X X), the lower ends of which rest upon the arched and corrugated plate (B), the space between the bricks and the girders being filled with mortar or concrete; and upon the upper curved

may be arranged to overlap each other, thus forming a continuous corrugated arch extending the length of the girders. The bearers (D) are in short sections, which may be readily fitted to the girder so as to form a continuous socket and abutment for the ends of the plates (B). A ceiling of this character will cost less than the brick arches, at the same time the improved ceiling will resist the action of fire more effectually than one of brick. In consequence of the comparatively slight weight of the plates (B), compared with that of a brick arch, girders (A) much lighter than those usually employed may be used. The plates (B), besides being greatly stiffened by their corrugations, are rendered still more rigid by the layer of concrete, and by the shape of the sockets, which fitting the said corrugations in the plate, prevents the same from being distended laterally under pressure. Apart from the superior lightness and economy of a ceiling thus constructed, it will be seen that the corrugated arched plates present a much more ornamental appearance than the usual plain arches. Plates corrugated differently from those described may be used, and braces of cast-iron or other materials may be substituted for the bricks or blocks (X X), or they may be dispensed with, and the entire space above the plates may be filled with concrete.

FIG. 5 illustrates two sections of the corrugated iron arches, or part of a finished ceiling, with concrete to the

Fig. 5.



and corrugated surface of the plate (B) is deposited a layer of concrete, filling the corrugation, and extending above the same. The edges of the plate (B)

surface of the beams, and the lower flange of the beams enclosed or covered with a galvanized iron casing, which makes a very ornamental finish.

Fig. 6.

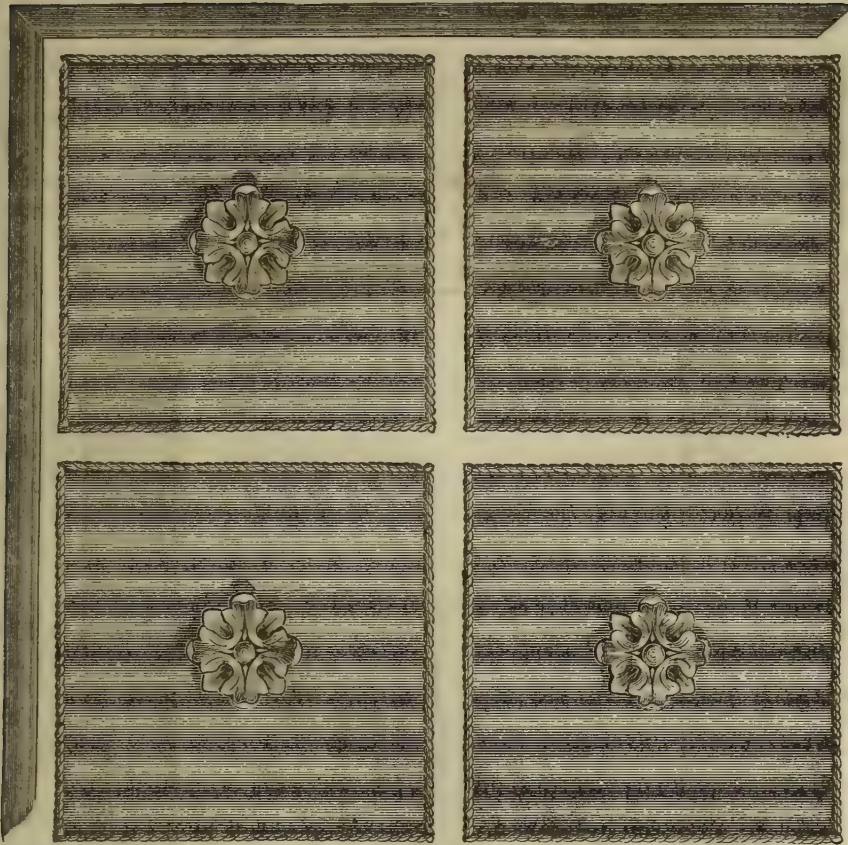


FIG. 6. A corrugated iron ceiling paneled, and ornamented with centre-pieces.

Fig. 7.



FIG. 7 is an end-view of the same.

Fig. 8.



FIG. 8. An iron arch, with inclined bricks at the haunches against the sides of the upper flanges of the beam, the lower ends resting upon the arched

plates, the space between the bricks and beams filled in with concrete, and a light layer of concrete upon the surface of the corrugated arched plates.

Fig. 9.



FIG. 9 illustrates the iron arch, dispensing with the use of bricks at the haunches thereof, as it is not necessary

to use them when the corrugated iron plates are filled in with concrete to the surface of the beams.

Fig. 10.

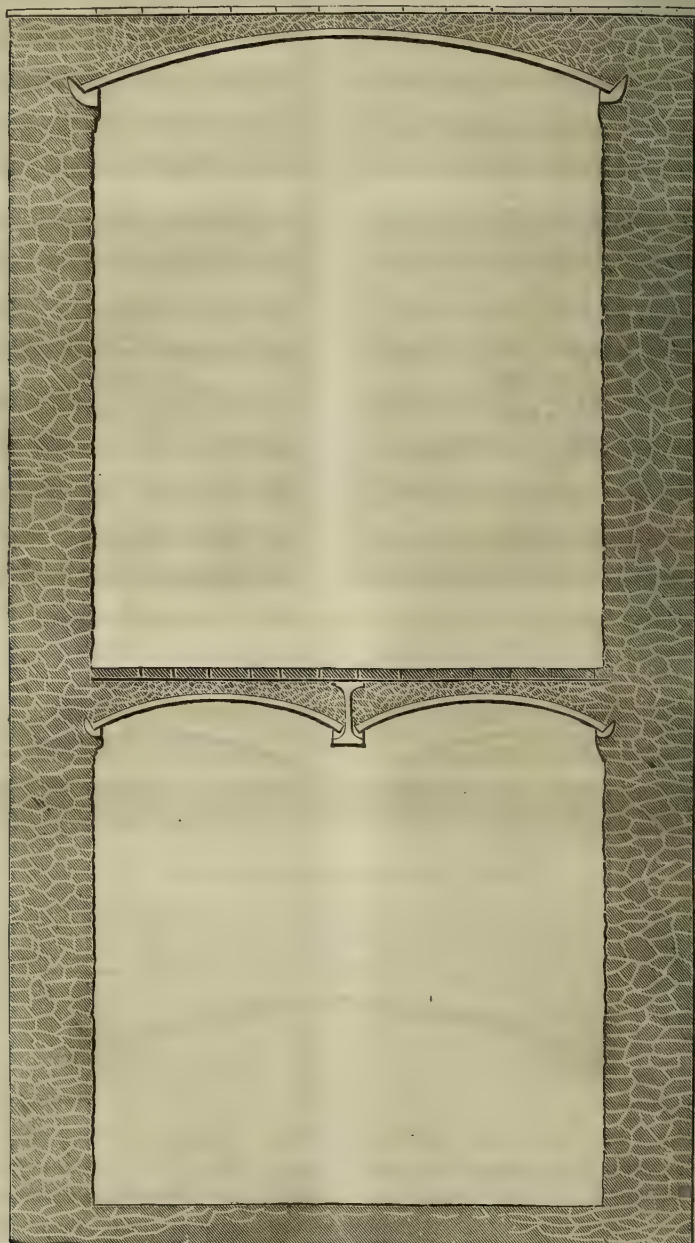


FIG. 10. Cells for jails or other purposes, for which these corrugated iron-arched plates are particularly adapted. The cut shows two cells, a single and double arch; the upper cell showing the single arch resting on the walls of the cells, and lower cell the double arch, using the iron beam.

Fig. 11.

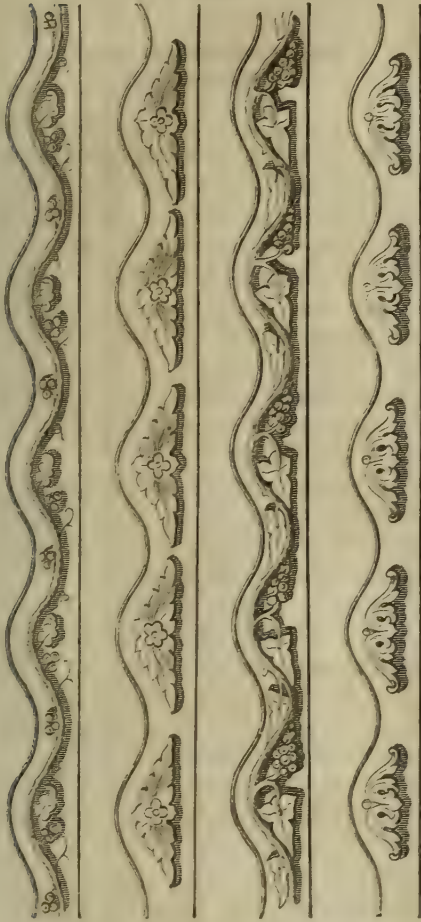


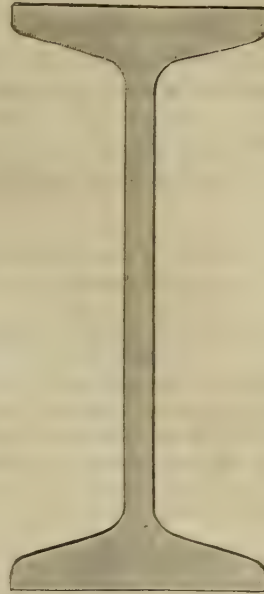
FIG. 11 illustrates the different styles of castings or socket-bearers on which the ends of the corrugated iron plates rest.

FIG. 12. Wrought-iron beams used in the construction of fire-proof buildings.

FIG. 13. A wrought-iron (I) beam, with socket-bearer resting on the lower flange thereof, on which rest the ends of the corrugated iron plates which are

riveted thereto, forming an abutment of great strength and solidity, and giving a very complete and substantial finish.

Fig. 12.



Mr. Fairbairn, Civil Engineer, says: "Assuming wrought-iron plates one-fourth of an inch thick, and bent in the

Fig. 13.



segmental form of an arch, with the filling up of the haunches with concrete

to level the surface preparatory for the reception of the floors, this will be found a *floor of exceedingly light construction, perfectly fire-proof*, and containing all the elements of strength and rigidity which can possibly be attained by iron beams with brick arches, and I conceive that the time is not far distant when wrought-iron beams and wrought-iron plates will form the principal supports of the floors of fire-proof buildings."

Report from the Franklin Institute of Pennsylvania.

HALL OF THE FRANKLIN INSTITUTE,
PHILADELPHIA, Feb. 26, 1868.

The Committee on Science and the Arts, constituted by the Franklin Institute of the State of Pennsylvania, for the promotion of the Mechanic Arts, to whom was referred for examination a *Fire-Proof Ceiling invented by MR. JOSEPH GILBERT, of Philadelphia, Penn.*,

REPORT,

That the nature of the invention is in the use of CORRUGATED SHEET IRON, supported upon, and spanning the space between iron beams, the corrugations being so arranged that a series of alternate convex and concave arches extend as ribs and depressions across the space between the beams, thus giving to the sheets vertical stiffness. The sheets are covered with cement, which increases this stiffness and prevents moisture from penetrating downwards to the iron. The sheets may extend straight from beam to beam, or may be arched as is customary with brick or concrete fire-proof floors.

When used as flooring it is arched so that the top of its cement cover is nearly flush with that of the beams. Any description of floor may be laid on the beams. The intervening space between floor and arch may be filled with concrete, resting against haunches of brick placed next the sides of the beams. The corrugated sheets are secured to the beams (acting thus as ties or braces) by means of cast-iron ledges of suitable

shape, resting upon the lower flanges of the beams, and fastened thereto.

It will be evident from this description that the distinguishing feature of the mode under discussion, as compared with other plans of fire-proof floors, is in the substitution of corrugated sheet-iron, covered with cement for either brick or concrete arches, or for flat sheets of iron covered with cement.

The following advantages appear to be secured by it:

1st. A considerable reduction in the weight of the floor, which enables the beams to be lighter, and which, from both these causes, reduces the weight to be borne by the walls of the building.

2d. A saving of time in the execution of the work, and in scaffolding for completion of the building, as each story may be separately progressing without fear of accident, while the walls are laterally strengthened during the course of building.

3d. Some saving in story height may be effected, owing to the reduced thickness of the arch, without increasing the number of beams employed.

So far as regards its fire-proof qualities, the Committee believe it to be fully equal to either of the modes commonly employed. Possessing the advantages already enumerated, its introduction in lieu of other systems will, in the opinion of the Committee, be governed by commercial considerations, into which they cannot of course enter. There does not appear to be any good reason why its expense should be greater than brick arches on iron beams.

By order of the Committee.

WM. HAMILTON, *Actuary.*

MESSRS. J. VAUGHAN MERRICK,

THOS. S. STEWART,

EDWIN F. DURANG,

Committee of Examination.

The following Philadelphia architects have fully indorsed the foregoing Report

of the Committee of Science and Arts of the Franklin Institute of Pennsylvania :

John McArthur, Jr.; John Stewart; Samuel Sloan; James H. Windrim; John Fraser; George W. Hewitt; Frank Furness; J. C. Sidney, Isaac H. Hobbs & Son; George Summers; S. D. Button, and Richard B. Osborne, Civil Engineer.

J. P. Stidham & Co., Iron Workers, Philadelphia, say: "A No. 18 section of Gilbert's iron-arched ceiling sustained, two months, over six tons, dead weight, *on the arch itself*—all that could be piled on the space, viz., six feet by twenty-eight inches. It was tested in the presence of John C. Trautwine, Esq., civil engineer, and was witnessed by a number of our leading business men."

Edward W. Clark, Architect, of Washington, D. C., writes: "I am astonished at the rigidity of Gilbert's corrugated ceiling."

N. S. Bouton & Co., of Union Foundry Works, Chicago, Illinois, found that two sections of No. 16 iron arches, six feet long, and constructed as in the building, sustained upwards of nine tons weight which was placed upon it. The result was perfectly satisfactory, and an order given to put the "ceiling" in the new "Tribune Buildings."

A ceiling (or floor) constructed of wrought-iron beams and iron-arched plates corrugated, and resting in socket-bearers, will sustain at least two thousand pounds to the square foot without any deflection.

These ceilings can be put on buildings flat or level, if desired.

From the PHILADELPHIA PRESS, June 15, 1868.

KING & BAIRD have published a pamphlet entitled "Fire-proof Construction," which, in a small space, covers a wide field of utility. Property is literally annihilated, in many instances, to a vast extent, by the devouring element, and, even if there be no loss of life, the

interests of the many classes are thereby greatly damaged. A factory or a store may be burned down without injury to life or limb, but the capitalist suffers in his property, losing the profits which would have accrued from the fair employment of his money, and at "one fell swoop" his employes are thrown out of work. The factory may easily be rebuilt, though this must take time, but it often becomes extremely difficult to re-engage the workmen who are familiar with all the processes. Various plans for rendering buildings almost, if not wholly, fire-proof, have been suggested and tested, with more or less success. The great thing required is to prevent fire, which naturally ascends, from spreading from one story to another. If this could be done, a fire, at the worst, would devastate only the floor upon which its ravages began. The pamphlet before us shows very plainly by plans, sections, and descriptions, how this *can* be done, and done cheaply. It is by using corrugated iron ceilings, in which strength and rigidity are united to create the impossibility of a floor being affected by any fire. The plan has been referred to, and most favorably recommended, by the Committee of Science and Art of the Franklin Institute, in this city. On a practical question the opinions of practical men must have weight. We give credence, therefore, to such men as J. Vaughan Merrick, Thomas S. Stewart, and Edwin F. Durang, (the Franklin Institute Committee,) who report that arched ceilings made of corrugated sheet-iron, fixed to iron beams, with a layer of cement or concrete between floor or arch, can sustain a vast weight, and are wholly impervious to heat or moisture. The weight of the floor is greatly reduced, the weight upon the walls is thereby diminished, time is saved, and the cost so much curtailed that the expense need not be greater than that of brick arches on iron beams. The conclusions arrived at by this Committee are "fully en-

dorsed" (to use their own words) by Messrs. J. McArthur, Jr., John Stewart, Samuel Sloan, John Frazer, and several other eminent Philadelphia architects. The Corrugated Iron Ceilings are coming into use not only in this city, (though the patents are so recent as May and November, last year,) but in other places. There has been a little talk lately about "Philadelphia going to New York for a pump." Against this is the fact that the Queen Anne County Jail, Md., the Insane Asylum at Harrisburg, and the First National Bank of Chicago are respectively having these corrugated iron ceilings, which are also being put up in the new buildings of the Tribune Company in Chicago, where Harrison's patent boilers (another Philadelphia invention) are also being erected. The diminution of cost and the access of security are justly regarded as invaluable. Mr. Joseph Gilbert, a practical builder in Philadelphia, is the inventor of the patent iron ceiling. We have not attempted to do more than generalize, in this rapid sketch, of what appears to be the beginning of a great system of almost perfect prevention and security.

From the NORTH AMERICAN AND UNITED STATES GAZETTE, Philadelphia, March 19th, 1868.

THE MARCH OF PROGRESS.—Across the Atlantic more attention is paid to erecting fire-proof structures than on this side. In Paris, for instance, the fire department consists of but few engines, yet large fires seldom occur, because the regulations of Louis Napoleon's "pet city" are that all large buildings shall be made fire-proof. These grand old European capitals owe to Philadelphia a debt of gratitude, and to their credit be it said, they are not backward in making the justly due acknowledgment.

The "Gilbert" patent iron ceiling is

regarded all over Europe as insusceptible of further improvement, and the scientific journals of the Continent have spoken of its advantages.

It is something of a feather in the cap of Philadelphia that this invention is the result of the cogitation of one of our own citizens; and the leading architects and scientific men who have examined it, speak of it with unqualified commendation. The space of a newspaper forbids any elaborate or extended description of this remarkable invention.

From the CHICAGO TRIBUNE, May 28th, 1868.

The public has been made acquainted with the fact that the CHICAGO TRIBUNE Co. have completed their arrangements, and have commenced erecting a fire-proof building especially adapted to the necessities of their business, which they intend shall be in every respect a model of beauty, comfort and convenience, and an ornament to the city of Chicago. The building will be 72 feet on Dearborn street, and 121 feet on Madison street. It will be constructed entirely of stone, brick and iron, and four stories high above the basement. The joists or beams will be of rolled iron, from the "Union Iron Mills," of Pittsburg, Pa., and the ceilings of "Gilbert's patent corrugated iron ceiling," which invention has generally superseded the old brick arches. On the surface of this corrugated iron ceiling will be laid a concrete, filling all parts perfectly solid. The roof will be composed of metal, on a light framework fastened on an iron ceiling, the same as for the floors above described. All the stairways will be of iron. The cost of the building itself will be \$175,000.

Any further information can be obtained from Mr. Gilbert, No. 429 Walnut street, Philadelphia.

EASTER-NIGHT IN ROME.

BY CHARLES L. PHILLIPS.

[OUR readers will be pleased with the following very graphic article, from "The Catholic Standard," of May 9th, 1868, by a travelled and cultured young Philadelphian, whom we are happy to number amongst our friends:]

THE glorious solemnities which mark the celebration of Easter-Sunday within the walls of the Eternal City had all been duly performed. The dome of the Pontifical Basilica had ceased to reverberate those notes of indescribable sweetness, which arise at the moment of the elevation from the silver trumpets of the choir; the tens of thousands who congregate at this beautiful season from every quarter of the globe, to witness the splendid and wonderful ceremonies of the Church, had one by one dispersed to their temporary abodes, confused by the grandeur of all they had witnessed; the many gallant soldiers who in the morning had knelt in the piazza of St. Peter's, with presented arms, to receive the benediction of the Pope, had slowly retired in military order to their various posts; the echoes of the guns, whose salvos, thundering from the castle of St. Angelo, announce to the Campagna that the successor of the Apostles has bestowed his blessing on Rome and the world, had grown fainter and fainter as they diffused the glorious news, until at last they had expired amidst the hills of Tivoli. The joyous clamor of the bells had gradually died away upon the ear; the tokens of festivity had ceased; night had fallen over the churches and palaces, and all was silent within the boundaries of Rome.

The careless stranger, as he wandered through the streets, might have imagined from the stillness of the evening hour, that the ancient city around him, satisfied with the excitement of the day,

was soon to yield itself to undisturbed repose, in order that the coming morn might find it once more prepared for the busy realities of life. Such a conclusion would, however, have proved erroneous. A spectacle of surpassing magnificence was yet in store for its inhabitants.

Before the night had advanced very far upon its course, hundreds of carriages might be seen directing their way towards the enormous piazza, which forms the approach to the Church of St. Peter. Here they assumed a position which would enable their inmates to command a view of the Church and its immediate surroundings. It was about eight o'clock when my companion and myself arrived upon the spot and took our places amidst the crowd of vehicles, which momentarily grew thicker and thicker. I observed that the most perfect order prevailed among the masses around me, as though they were breathlessly awaiting the consummation of some startling event. Little, however, could be seen to excite either surprise or curiosity, excepting the shadowy outlines of that majestic edifice, before whose solemn portals was now assembled a mighty concourse of human beings, convened from every clime, and professing every variety of belief. But the sight of this venerable pile, arising in colossal majesty amidst the darkness of the night, was more than enough to fix my attention, and absorb my faculties. As I scanned its vast extent, and noticed the effect of its wonderful architecture, I could not refrain from thinking how fitly it represented the dignity and preponderance of the Christian religion. Peerless beyond comparison, and destined to withstand for countless generations the wasting effects of time, it almost ap-

peared to proclaim aloud, through the stony lips of its saintly statues, the enduring excellence, the unapproachable beauty, and the everlasting grandeur of the Church. Every feature of its towering walls, every line of its surprising proportions, seemed as if designed by some master genius to convey to the mind of the beholder a lasting idea of that purity and that harmony which dwell neither in metals nor in stone, but which exist in the sublime and unfading realities of Christian faith and Christian feeling. Yielding indulgently to this train of thought, I permitted my mind to wander from the things about me, and was speedily lost in the consideration of those ennobling truths which were naturally suggested by the occasion. I was soon, however, aroused from my reveries by the appearance of a phenomenon as magnificent as it was sudden. The shadowy dome, the dark and solemn colonnades of St. Peter's were no longer before me. In their place stood a gigantic edifice, the same in outline, it is true, but resplendent, with a flood of silvery light, amidst whose delicate radiations every portion of the mighty structure became beautifully visible. From the summit of the cross to the pavement of the piazza, thousands of scintillations seemed emanating from the sculptured stone, as though the inner light of the tabernacle were bursting from its confinement and seeking to diffuse its beams throughout the world. Filled with admiration, and rendered speechless by the beauty of the spectacle, the crowd remained motionless, gazing with avidity upon the illuminated temple, and seeking in vain to satisfy its appreciation of the glories which greeted its sight.

But something yet remained to perfect the brilliancy of the scene, and complete the astonishment of the multitude. Scarcely had their gaze grown somewhat accustomed to this marvellous picture, when it faded from their view, but only to yield place to a second phenomenon

more surprising in its splendor than the first. As the silvery lights disappeared in rapid succession, a blaze of golden fire darted in a myriad of jets from every part of the façade, and spread with the celerity of flame over the remaining portions of the edifice, giving to the atmosphere that brilliant hue which accompanies the fall of a thousand aerolites. It seemed as if an angel, working with the speed of lightning, had traced in fiery outlines upon the canvas of night each cornice and column, each pilaster and frieze, and had crowned them all with a resplendent dome, from whose summit blazed the emblem of Christianity. Disregarding every object of meaner interest, I permitted myself to become totally absorbed in the contemplation of a sight so charming, that it alone would have repaid the distant traveller for all his fatigues, both on sea and on land.

It is thus that the Pontiffs seek to honor the holy festival of Easter; it is thus that they yearly astonish the world by the magnificence of their piety.

At length, when the admiration of the crowd had become partially appeased, the carriages began to disperse from the piazza. In continuous lines they crossed the bridges which span the Tiber, and having reached the fashionable quarter of Rome, were quickly lost to sight amidst the darkness which now extended over the city. The neighborhood of the Vatican was again deserted, and the declining lights left to smoulder in the growing solitude of the night.

As I drove away towards the Corso, I happened by accident to glance behind me, when I beheld the cross, which surmounts the dome, shining aloft by itself in the quiet atmosphere, every other portion of the church being concealed from my view by hundreds of intervening buildings. This sight, presenting itself unexpectedly, like a constellation in the heavens, produced an effect peculiarly charming, and seemed to my admiring gaze more like a celestial

prodigy than an exhibition of human art. Sparkling alone and undiminished above the seven hills, with their superb but crumbling remains of antiquity, it offered, I thought, a touching and truthful figure of that sublime and simple faith, under whose irresistible influence the Rome of the Cæsars had become transformed into the Rome of St. Peter, and the pagan capital of a boundless empire been made the centre of unity

for the persecuted advocates of an unsullied religion.

I was now nearing my abode for the night, and with a feeling of regret I turned once more to catch a parting view of that beautiful cross, ere its fires should fade from my view; but there it still remained, pure, solitary, and radiant, like the meteor of Constantine, a glorious emblem of Christianity triumphing over the world.

THE NEW MASONIC TEMPLE, PHILADELPHIA.

AS the corner-stone of the new Masonic Hall, at the northeast corner of Broad and Filbert streets—of a species of granite quarried near Port Deposit, Md., weighing nearly eleven tons, and containing in its cavity, Masonic papers, laws, coins, newspapers and other relics—was laid St. John's Day, June 24, 1868, A. D.—5868 A. L.—with appropriate ceremonies, by M. W. Grand Master Richard Vaux, the Masonic solemnities being the most imposing ever witnessed in this city, a description of the contemplated building may be interesting.

"*The Keystone*," of June 27, 1868, furnishes the following points:

The dimensions of the lot for the intended structure are 150 feet on Broad street and 250 feet on Filbert street.

The building will recede from the property line twenty feet on Broad street and six feet from Filbert street.

The exterior of the building upon each front will be of granite, and built in the Norman style of architecture, which is well adapted to the magnitude of the structure, and appropriate in its details for execution in the materials adopted for the exterior facings.

The principal entrance and central figure of the Broad street front is emblematic of the Order, and indicative of the steps in Masonry.

First stage—The Egyptian porch, upon which stands the figure of "Silence." Second—The "broken pediment," unfinished work, upon which is placed the figure of "Obedience." Third—By a completion and connection of the design in style and character, with the general building, representing the emblems of the craft in finished work, including "Faith, Hope and Charity," and above all "the All-seeing eye."

Completing the Broad street front on each end are towers, of which the principal one on the northeast corner will be forty feet square at the base, extending two hundred and twenty feet in height above the ground.

The flank of the building will be relieved by massive buttresses, terminating in a string arch course, deeply recessed. The central feature of gablets and small tower will give additional accommodation in connection with the *entresol* story at the eastern end of the building.

There will be a large central entrance on Juniper street, and also a business entrance on Filbert street, leading to the offices of the R. W. Grand Secretary and R. W. Grand Treasurer. Beneath the whole building will be a large cellar, with every convenience, for the accommodation of the heating apparatus.

The building will consist of a first story, and the principal floor or second

story, which will be subdivided on the eastern and western ends, forming *entresol* stories to these portions.

The entrance on Broad street opens into the general hall, 20 feet in width, extending through to Juniper street. This hall is enlarged to the dimensions of 40 feet long by 46 feet wide, at the point where the grand marble staircase will extend to the principal floor. It is also increased at the eastern main staircase to 26 feet in width. These different stairs by their location will form the most direct approach to the Lodge-rooms, and continue as a main staircase up to the *entresol* stories.

On the north side of the hall, on the Broad street front, will be the parlors for the use of the grand officers, and also a private office for the R. W. Grand Master; separated from these by a cross-hall will be the magnificent supper-room, 105 feet long by 53 wide, with kitchen, store, and carving-rooms adjoining. The approaches to the store-rooms and kitchen will extend from the Cuthbert street front. On the south side of the main hall, on Broad street, will be finely decorated offices for the use of the R. W. Grand Secretary and R. W. Grand Treasurer, which will be approached from the business entrance on Filbert street.

In the centre of this floor will be the various committee rooms, and in the southeast corner a fine large room for the library, which will receive an abundance of light from two sides.

The clear height of this story will be 26 feet to the ceiling. The principal story will be approached by the grand staircase on the main hall and the large staircase on the eastern end of the building. The main hall, 46 feet long by 40 feet wide, will lead to the main staircase, which will be connected with a centre hall in the eastern part of the building, 20 feet wide. On each side of the hall on the Broad street front will be the waiting lobbies and parlors belonging to the Grand Lodge and Grand Chapter

rooms. These lobbies will be in the form of alcoves, separated from the general thoroughfare of the hall.

On the north side of the hall will be located the Grand Lodge room, 104 feet long by 53 feet wide, with a clear height to the ceiling of 41 feet. This room will be furnished with the best art known to the upholsterer, to make it befitting to the character and dignity of the grand body which will hold its sessions here. The necessary ante-rooms will be so connected with this room as to be of convenient access.

On the south side of the hall will be the Grand Chapter room, 81 feet long by 53 feet wide, 38 feet high, with the necessary ante-rooms. This will be fitted up in a similarly elegant manner with the Grand Lodge room. In the *entresol* story, over the parlors on the Broad street front, will be several regalia rooms, on the north side of the hall for the Grand Lodge, and on the south side for the Grand Chapter. The regalia rooms of the different lodges will be approached by private stairs leading to the lobbies from the lodge rooms.

At the eastern end of the building, alcoved and separated from the main hall, will be the general waiting lobby connecting the three Blue Lodge rooms. These rooms will be respectively 59 feet long by 43 feet wide, 57 feet long by 42 feet wide, and 68 feet long by 43 feet wide, each with a clear height to the ceiling of 23 feet. These rooms will each have the requisite ante-rooms attached, and also a large lobby with accommodations for the hats, coats, &c., of the members, so that the general halls will not be encumbered with these articles.

Above the entire eastern end of the building will be an *entresol* story with a surface equal to the three lodge rooms. This will be divided into three encampment rooms of the respective sizes of the Blue rooms.

The entire building will have dressing and wash-rooms located in convenient

places throughout. The girders of the building will be of iron, and the structure will be entirely fire-proof. The towers on each end of the building will command most superb views of the city and the country around.

In front of the windows on Broad street, which will be arched at the top, will be placed balconies and balustrades of granite. The building will be heated by means of steam generated in the cellar. Ample means of ventilation will be provided, and the different rooms so proportioned as to give the best acoustic advantages. The building in its general characteristics will be of such a description as to enable a Mason who is a stranger in the city at once to detect its ownership and use by a glance. The ceremonies of laying the corner stone were most imposing. The architect is Mr. James Windrim, of this city, whose design was selected from amongst a number presented. It is estimated that it will take five years to complete this temple, and that its cost will be \$750,000.

We are glad that the Freemasons of Philadelphia, now and for a long time back, greatly crowded in their present hall on Chestnut street, north side above Seventh, are to have a spacious, well-appointed and elegantly decorated temple, on the future handsomest street of the city.—*Eds.*

SCHOOL OF DESIGN FOR WOMEN.—The following named gentlemen were, on the 23d ult., elected Directors of the Philadelphia School of Design for Women: William J. Horstmann, P. P. Morris, James L. Claghorn, James H. Orne, David S. Brown, Redwood F. Warner, James A. Wright, George Whitney, E. W. Clark, W. P. Wilstach, Jay Cooke, and John Sartain.

MR. PEABODY'S dwellings for the London poor have a population of 1,583, and more are to be erected.—*Morning Post*, April 18, 1868.

THE PROPOSED NEW BRIDGE ACROSS THE SCHUYLKILL.—The Highway and Survey Committees of Councils, by invitation of a committee of citizens residing in the Twenty-fourth ward, visited the site for the proposed bridge across the Schuylkill, on the 4th of April last. The Pennsylvania Railroad, which crosses Bridge street, renders travel to and fro extremely dangerous, and to obviate this the citizens residing in that section of the city have taken steps to insure safety to all who may be compelled to cross the wire bridge. The only feasible plan that suggested itself to the minds of those having the matter in charge is the erection of a bridge, which shall cross the Pennsylvania Railroad, thus avoiding the danger of accident by the approach of any of the numerous trains which pass over that road.

It is proposed to construct the bridge over the Schuylkill on the line of Bridge street, as now laid out and used west of the Pennsylvania Railroad, above grade, striking grade at Callowhill street, on the east side of the river, at the intersection of Biddle street.

The following correspondence may be of interest to our readers:

PHILADELPHIA, *March 24, 1868.*
No. 3500 Hamilton Street.

J. EDGAR THOMSON, ESQ.,
President Pennsylvania Railroad Company.

DEAR SIR: The dangerous crossing of the Pennsylvania Railroad, at Bridge street, in the Twenty-fourth ward, and the steep grades of Bridge and Haverford streets, being obstructions to travel, detrimental to the interests of the city, and injurious to property in that vicinity, it has become necessary to devise a method of avoiding the danger, reducing the grade, and giving a proper and much needed outlet to travel and traffic, and, at the same time, not interfere with the valuable interests of the corporation over which you preside. For this purpose it is proposed to construct a per-

manent bridge over the Schuylkill, on the line of Bridge street, as now laid out and used west of the Pennsylvania Railroad, above grade, striking grade at Callowhill street, on the east side of the river, at or near the intersection of Biddle street; and application will be made to Councils therefor. Your opinion on the subject will be of much importance, and I am therefore directed by the committee of citizens having the matter more particularly in charge to respectfully ask for your answers to the following questions:

First. Is not the intersection of Bridge street and the Pennsylvania Railroad, at grade, exceedingly dangerous, and an impediment to the business of your company?

Second. Would not a crossing above grade be vastly to the interest of your company?

Third. Would it not enable the railroad company to conduct its vast business without hindrance, and render the crossing perfectly safe for all?

Fourth. Would you not be in favor of the prompt passage by Councils of an ordinance for the erection of a bridge on the line of Bridge street, as laid out and used west of the Pennsylvania Railroad, as affording the surest, safest, and cheapest mode of obviating the dangers and inconveniences alluded to?

Trusting your convenience may prompt an early answer,

I remain, very respectfully, your obedient servant,

ALBERT S. ASHMEAD, Secretary.

PENNSYLVANIA RAILROAD, President's Office,
Philadelphia, March 27, 1868.

DEAR SIR: In answer to your first question, I would say that the crossing at the intersection of the Pennsylvania Railroad and Bridge street is very dangerous to the public travel on said street, and that the caution required in passing it is an inconvenience to the operations of the Pennsylvania Railroad.

To your second question I would re-

ply that an overland crossing at Bridge street would save the Pennsylvania Railroad Company some attention to their trains, now necessary to the safety of the public.

The third question is answered by the second. To the fourth I would say that I am in favor of any plan by which the risks and inconveniences referred to could be obviated. The profile of the crossing on the line of Bridge street, submitted by you from a point west of the Pennsylvania Railroad to Callowhill street, near the intersection of Biddle street, would meet the objections you have in view.

Yours, truly,
J. EDGAR THOMPSON.

TO ALBERT S. ASHMEAD, ESQ.,
Secretary of the Committee.

THE AGE NEWSPAPER.—The proprietors of *The Age* newspaper have removed to their spacious new building, Nos. 14 and 16 South Seventh street, above Chestnut.

The building is four stories in height, having a front of fine-pressed brick. The exterior view presents the tasteful appearance of a structure sixty feet in height, and crowned with a large sign bearing the simple words, "*The Age*."

The basement is appropriated to the press-room, and the dimensions are thirty-four by seventy feet. It has entrances from the front and rear, and, in adapting it to its purposes, care has been observed to provide for the comfort of the employees. The press, which was in use at the old building, is located close by the north wall and near the Seventh street side, while the engine and boilers, which are new and of recent make, are built in the northwest corner of the basement. The floor of the room is nicely boarded, and the basement itself, put in repair, giving it a cosy appearance, is very comfortable for those there employed.

Care has also been taken by the proprietors to secure space enough in the

press-room to admit of the erection of another press in a short time, the increased demand for *The Age* compelling such an addition.

The counting-room is one of the most elegant that ingenuity and taste could construct. No expense has been spared to place it in keeping with the advancement of *The Age*, and to make it the conspicuous feature of the establishment. It is upon the first floor proper, seventeen by seventy feet in size, with a lofty ceiling; around the walls is placed a richly-grained wainscoting, some three feet in height; above this they have been ornamented with that latest of novelties, black walnut hangings, which, with a lighter-colored paper, ingeniously designed, gives to the walls an elegant, panelled appearance. Great care has been taken in the arrangement of this room, which properly combines both the publication and counting-offices.

The counter, an excellent piece of work, is of solid walnut, in keeping with the characteristic colors of the room. At the point where it starts from the northern wall is the post-office department; at the other end of the counter, which runs nearly in the centre of the room, and at a distance of nearly forty-three feet is the bookkeeper's desk, with all its array of drawers, cubbies, and pigeon-holes. In the rear of this is the cashier's sanctum, and in it is placed one of the largest fire and burglar-proof safes. In the rear of this again is the private office of the proprietors. This is separated from the other portion of the room by an ornamented black walnut partition, having apertures filled in with plate glass.

The editorial rooms are upon the third floor of the building, and together cover an area seventeen by seventy feet. This space is divided into five rooms, in a manner that will lend the greatest degree of comfort and convenience to the editors and members of the reportorial staff. Here, as in the majority of news-

paper establishments, the editorial rooms will be pleasantly fitted up, carpeted, well lighted, and furnished with the essentials that are necessary to the convenience of the literary staff. The rooms are all connected; and the two centre ones, by means of folding-doors, can be thrown into one, thus forming a large drawing-room. There are arrangements for files of exchanges, works of reference, &c., and such other features as will aid in the rapid management of the business of this department.

On the fourth floor is the composing-room, and it is one of the finest in the city. As for ventilation and light, it cannot be excelled. On the Seventh street front there are six windows, on the north side five, on the south three, and in the rear three, thus assisting the compositors to perform expeditiously and properly their part in the publication of *The Age*. The want of light is one of the great evils that compositors have to contend with, but this has been happily avoided in this department. Another evil is the want of ventilation, and this likewise has been avoided by selecting a very high structure, which looms up above those in the immediate neighborhood.—*Philadelphia Press*, June 11.

THE PARK COMMISSIONERS—ELECTION OF CHIEF ENGINEER.—The members of the Park Commission held a meeting on the 3d of April, at the Mayor's office, for the purpose of adopting measures for the immediate commencement of the improvements to be made to the Park. During the meeting, John C. Cresson, Esq., for many years at the head of the Philadelphia Gas Works, was elected Chief Engineer of the Park. Mr. Cresson being a member of the Park Commission, resigned from the Board after his election as Engineer. This is a deserved honor, the new Chief Engineer being a gentleman of scientific attainments, long identified with the welfare of Philadelphia.—*Eds.*

PHILADELPHIA SAVING FUND SOCIETY.—The corner-stone of the building to be erected by the Philadelphia Saving Fund Society, at the corner of Walnut and Seventh streets, was laid on the 15th June. The interest of the occasion was heightened by the presence of Charles N. Bancker, the only survivor of the incorporators, who, at the advanced age of ninety-one years, was present, by invitation, to lay the corner-stone. The ceremonies were opened by Mr. Caleb Cope, president of the society, who made a brief address. He said that the institution was founded in the year 1816, and that the first office occupied was located on Sixth street, nearly opposite Minor. From thence it removed to the south-east corner of Sixth and Minor streets. In the year 1821, an office was rented on the west side of Decatur street, near Carpenter. Five years afterwards it was removed to the southeast corner of Third and Walnut streets, up-stairs. In October, 1827, there was a removal to No. 66 Walnut street, now No. 304, and in 1840, to the present location.

INDUSTRIAL HOME FOR GIRLS.—It was with pleasure, that we noticed the fact of a building having been obtained for the Industrial Home for Girls at Tenth and Catharine streets. The managers of this excellent institution determined to replenish their treasury, and with this view they gave a very delightful entertainment on Tuesday evening at the Amateur's Drawing-room. Dr. L. R. Koecker was the prestidigitateur on the occasion, and for nearly two hours he delighted his audience by some wonderful and well-executed experiments in magic. Successful in every trick, he was justly greeted with applause at the termination of each one of them. Then followed the Sphynx, which was superior to any similar delusion we have ever witnessed. The rope-dancers attracted much attention, and when the Lilliputian family appeared

the audience became convulsed with laughter, and although it was after eleven o'clock when the curtain fell, many left with regret, the juveniles being taken away with much reluctance on their part. Mr. Berger, who assisted Dr. Koecker, contributed much to the pleasing entertainment and was warmly appreciated.

The Industrial Home is perhaps the only one in this country where girls are instructed in household duties and rendered competent to obtain an honest livelihood. The excellent managers have shown great wisdom in affording a delightful evening's entertainment to their friends, and thereby securing funds for their treasury. Every seat in the magnificent drawing-room was taken, and no place of amusement held a more delighted audience.—*Press, May 14.*

The gentlemen adverted to in the above are no more than deservedly praised. Dr. Koecker, the duke of amateurs, is a thorough mechanician and a good artist, possessing, besides, much general talent. The automata spoken of are, doubtless, of his own construction; and he has something of Robert-Houdin's natural tendency to slight of hand.—*Ed.*

THE LYLE MONUMENT—The contractor for the monument to be erected over the remains of the late David M. Lyle, Chief Engineer of the Fire Department, has caused to be completed the model of the statue, at his rooms, Eleventh and Parrish streets. The model is a fine piece of workmanship. The statue is six feet six inches in height, and is a faithful representation of the late Chief. It presents him in full equipments, with hat in one hand and horn in the other, standing alongside of a fire-plug. The work of cutting the statue in marble will shortly be begun, and when completed, will be to the entire satisfaction of the Fire Department.

THE ACADEMY OF NATURAL SCIENCES.—Since the rejection of the bill by the Legislature providing for the donation of Penn Square for the purposes of the Academy of Natural Sciences, the Philosophical Society, Franklin Institute, Philadelphia Library, Academy of Fine Arts, and other institutions, the directors of the Academy of Natural Sciences have been busily engaged in looking for a site on which to erect a building commensurate with their wants. They have at last closed a bargain with the managers of the Wills Hospital, for the purchase of the lot of ground on the west side of Nineteenth street, running from Race to Cherry streets, extending 160 feet on Race and 190 feet on Cherry street. The price paid was \$60,000. The Society will in a few weeks start the building, which will be put up in a plain but substantial manner, and, it is thought, will be ready for occupation before the winter sets in. This is a good location, being surrounded by many other public buildings, and directly in front of Logan Square.

NICHOLSON PAVEMENT EXTENSION.—A number of gentlemen interested in the improvement of the city have started a plan to have the whole extent of Twelfth street repaved with this pavement, the trial of which on Broad has proved so satisfactory to our citizens. Twelfth is the first north and south street west of the river Delaware now unobstructed by passenger railways, and should forever be kept free for the purposes of parades, carriage travel, &c. Although the owners of property along this street, except in the old city limits, have already paid for the present cobble pavement, many of them are now willing to incur one-half the expense of the new pavement, in order to secure a great public improvement. Petitions to Councils for this purpose are now being circulated for the signature of property-holders, and will be shortly presented.

MERCHANTVILLE is certainly one of the most delightful of the many delightful suburban villages encircling Philadelphia. This fact was fully realized on Saturday afternoon by a large party of merchants and prominent citizens of this sun-persecuted town, who became for a few hours the guests of the Hon. Alexander G. Cattell, United States Senator from New Jersey, and his brother and business associate, Elijah G. Cattell, Esq. By invitation of these gentlemen, the guests assembled at Market street ferry, at a quarter after four o'clock, reaching Merchantville after a pleasant ride of only four miles, from the Camden slip by a special train over the Burlington county railroad. An ample collation was spread in a grove near the stopping-place, strawberries such as are grown only in the sands of Jersey being the chief attraction. After due attention had been given to these delicious fruits, short and humorous addresses were made by several gentlemen, and then Merchantville was inspected with great interest by all the members of the party, who were favorably impressed with the advantages which it offers as a country residence for the business men of Philadelphia. There is still abundance of room for the erection of residences, with fine grounds attached, and when the village has fairly attracted the attention of Philadelphians, its growth is destined to be both rapid and beautiful. The party re-assembled at the residence of Senator Cattell, and at 8 o'clock again took the cars for the city, thoroughly delighted with the adventures and enjoyments of the day.—*Evening Telegraph, June 22d.*

A DEPARTMENT of Science and Art for Ireland, separate from that which already exists, is to be appointed. A commission has received powers to inquire into the best mode of carrying out the objects of such a department.

PHILADELPHIA, with her eight hundred thousand inhabitants, returns 108,182 buildings. Of this number 385 are churches, 253 schools, public and denominational; 1,266 mills and factories, 60 public institutions, 27 theatres and halls, and 86 hose-houses, leaving over one hundred thousand for dwelling-houses, or one house to every eight persons. Of these buildings a very large proportion is substantially built, stone and brick predominating.

Probably no other large city in the world can present so desirable an exhibit. Philadelphia is pre-eminently the city for the workingman—the only large centre of labor and wealth where he can command a home. Contrasted with New York, and its tenement houses, it is luxury. This fact alone should attract thousands of laboring men to seek our shops and manufactories in preference to any other. What is the use of working where you cannot live? Here, almost alone of all the great cities—thanks to our humane system of building in courts—the laboring man can have a home that will afford comfort and save his family from shame and ruin.

So far a valued daily; but we think that even our fashion of building in courts could be improved upon. Witness the neat and clean intermediate north and south streets, between Eleventh and Twelfth and Master and Jefferson.—*Eds.*

THE NEW BUILDING AT AMHERST COLLEGE—A GENEROUS BENEFACTION.—A correspondent of the *Springfield Republican* writes from Amherst that the corner-stone of Walker Hall was laid a few days ago, and adds: The total amount of Dr. Walker's benefaction to the college exceeds \$200,000, about \$120,000 of which have been received since his death: and this, though the four institutions which were his residuary legatees have generously given up \$300,-

000, which would have accrued to them, to Dr. Walker's family. But the idea, too prevalent, that this building, so long needed and talked about, is to be built exclusively by money given by Dr. Walker, should be at once corrected. Samuel Williston, of Easthampton: Samuel Hitchcock, of Brimfield, and James Smith, of Philadelphia, have each given \$10,000 towards it, and another \$10,000 has been made up by others, largely by Mr. Hardy, of Boston, and J. C. Baldwin, of New York, who had the disposal of a legacy left by his brother. Mr. Hardy, indeed, took occasion to speak strongly of the other benefactors of the college, and alluding to Mr. Williston, who was present, and to his former assistance in a time of great need, did not hesitate to call him the corner-stone and saviour of the college.

"The style of the building thus fairly begun, is what is known as the revived mediæval, and while simple in detail, will be imposing in its mass and outline. It is to be built of Monson granite, and to this material will be added dark sandstone in bands, tracery, and capitals, occasionally used for contrast and relief. At the east and west ends, also on the south, will be small towers, rising slightly above the roof, relieved by a central tower surmounting the entire roof, and rising to a height of one hundred and twenty feet above the ground. The building is to be one hundred and twenty feet long and sixty-five feet wide, not including porches. On the opposite side of the main edifice, north and south, there will be spacious stone porches, with ascending steps, thirty feet in breadth. The edifice is to be three stories high, besides a spacious basement, each story to be fifteen feet high. When completed, the building will be known as Walker Hall, and will cost, finished and furnished, about \$130,000. The architect is Mr. George Hathorne, of New York.

A MAGICIAN'S RETREAT—AN ELECTRIC SERVANT, SENTINEL, AND MONITOR.—Robert-Houdin, the great prestidigitateur of modern times, lives in a charming mansion called the "Priory," in the village of Saint Gervais, upon the right bank of the Loire, about one and a half miles from the city of Blois. His dwelling, with the spacious grounds surrounding it, are believed by the common people of the vicinity to be controlled by some mysterious agent; and, in their eyes, the owner has an almost supernatural reputation.

The main entrance to the Priory is a carriage-way closed by a gate. Upon the left of this is a door for the admission of visitors on foot; on the right is placed a letter-box. The mansion is situated a quarter of a mile distant, and is approached by a broad and winding road, well shaded with trees. The visitor presenting himself before the door on the left sees a gilt plate bearing the name of Robert-Houdin, below which is a small gilt knocker. He raises this according to his fancy, but no matter how feeble the blow, a delicately-tuned chime of bells, sounding through the mansion, announces his presence. When the attendant touches a button placed in the hall, the chime ceases, the bolt at the entrance is thrown back, the name of Robert-Houdin disappears from the door, and in its place appears the word "entrez," in white enamel. The visitor pushes open the door and enters; it closes, with a spring behind him, and he cannot depart without permission. This door, in opening, sounds two distinct chimes, which are repeated in the inverse order of closing. Four distinct sounds, then, separated by equal intervals, are produced. In this way a single visitor is announced. If many come together, as each holds the door open for the next, the interval between the first two and the last two strokes indicates, with great accuracy, especially to a practised ear, the number who have entered, and the

preparation for their reception is made accordingly.

A resident of the place is readily distinguished; for, knowing in advance what is to occur, he knocks, and, at the instant when the bolt slips back, he enters. The four equidistant strokes follow immediately the pressing of the button. But a new visitor, surprised at the appearance of the word "entrez," hesitates a second or two, then presses open the door gradually, and enters slowly. The four strokes, now separated by a short interval, succeed the pressing of the button by quite an appreciable time, and the host makes ready to receive a stranger. The travelling beggar, fearful of committing some indiscretion, raises timidly the knocker; he hesitates to enter, and when he does, it is only with great slowness and caution. This the chimes unerringly announce. It seems to persons at the house as if they actually saw the poor mendicant pass the entrance; and in going to meet him, they are never mistaken. When a carriage arrives at the Priory, the driver descends from his box, enters the door by the method now described, and is directed to the key of the gate by a suitable inscription. He unlocks the gate and swings open its two parts; the movement is announced at the house, and on a table in the hall, bearing the words, "The gate is—," appear the word "open" or "closed," according to the fact. The letter-box, too, has an electric communication with the house. The carrier, previously instructed, drops in first all the printed matter together; then, he adds the letters, one by one. Each addition sounds the chime; and the owner, even if he has not yet risen, is apprised of the character of the despatches. To avoid sending letters to the village, they are written in the evening; and a commutator is so arranged that when the carrier drops the mail into the box the next morning, the electricity, in place of

sounding the chime in the house, sounds one over his head. Thus warned he comes up to the house to leave what he has brought, and to take away the letters ready for mailing. "My electric door-keeper then (says Houdin) leaves me nothing to be desired. His service is most exact; his fidelity is thoroughly proven; his discretion is unequalled; and, as to his salary, I doubt the possibility of obtaining an equal service for a smaller remuneration."

The study clock transmits the time to two dial plates. One, placed upon the front of the house, gives the hour of the day to the neighborhood; the other, fastened to the gardener's lodge, facing the house, gives the time to its inmates. Several smaller dials, operated similarly, are placed in the various apartments. They all, however, have but a single striking part, but this is powerful enough to be heard over the entire village. Upon the top of the house is a tower containing a bell on which the hours of meals are announced. Below this is a train of wheel-work to raise the hammer. To avoid the necessity of winding up the weight every day, an automatic arrangement is employed, which utilizes a force ordinarily lost. Between the kitchen, situated upon the ground-floor, and the clock-work in the garret, there is a contrivance so arranged that the servants, in going to and fro, about their work, wind up the weight, without being conscious of it. An electric current set in motion by the study-regulator, raises the detent, and permits the number of strokes indicated by the dial. This manner of distributing the time from the study, Houdin finds very useful. When, for any reason, he wishes the meals hurried or retarded, he presses a secret key, and the time upon all the dials is altered to suit his convenience. The cook finds often that the time passes very rapidly; while a quarter of an hour or more, not otherwise attainable, is gained by M. Houdin.

Every morning this clock sends, at

different hours, electric impulses to awaken three persons, the first of whom is the gardener. But, in addition, the apparatus forces them to rise, by continuing to sound until the circuit is broken by moving a small key placed at the further end of the room. To do this the sleeper must rise, and then the object sought is accomplished. The poor gardener is almost tormented by this electricity. The greenhouse is so arranged that he cannot raise its temperature above ten degrees Centigrade (50 degrees Fahrenheit), or let it fall below thirty degrees C. (37 degrees F.), without a record in the study. The next morning Houdin says to him, "Jean, you had too much heat last night; you will scorch my geraniums;" or, "Jean, you are in danger of freezing my orange trees; the thermometer descended to three degrees below zero (27 degrees F.) last night." Jean scratches his head and says nothing, but he evidently regards Houdin as a sorcerer.—*Yale College Courant*.

PIGMENTS IN MADDER.—Taking advantage of M. Schutzenberger's investigation of madder, which was proved to contain five pigments, M. Martin has lately perfected and patented in France a process for transforming four of them into the only one (alazarine) yielding an unalterable dye. The several coloring matters are first dissolved in concentrated sulphuric acid, and then zinc is added. The reaction is accelerated by the use of powdered zinc and the application of heat; when it is completed the mass is diluted with water, and the abundant precipitate is the required dye, which, after being washed with water, is ready for use. Thus orange-madder, purpurine, pseudo-purpurine, and xantho-purpurine are transformed into alazarine. This process for making available all the coloring matter in madder seems to be important in a pecuniary, as well as scientific, point of view.

SLOAN'S ARCHITECTURAL REVIEW AND BUILDERS' JOURNAL.

AN ILLUSTRATED MONTHLY.

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MONTHLY REVIEW.

THE TWO MANSARTS AND THE MANSARD ROOF.

THIS roof, either from certain minor characteristics, or the caprice of designers,—variously known by the titles, Curb roof, French roof and Mansarde, or Mansard roof,—was the invention of a celebrated French architect of the name of Mansart. Yet this is hardly definitive, since in the very same period at the French court, flourished two celebrated architects of that surname, uncle and nephew. It is with the uncle, the originator of the French roof, that we have first to do.

The son of the King's carpenter, FRANÇOIS MANSART, was born in Paris, in the year 1598. He was carefully educated; and received those professional instructions, leading him on to eminence, from the famous Gautier. Mansart's high rank, as an architect, however, was mainly attributable to the force of his own genius. Borne along by a fertile imagination, united with sublime ideas in theory, chastened by great taste and judgment in execution, he fairly attained, in his projections, the height of the greatest masters. We say in his projections; not that he was unable to execute, in the best and most agreeable manner, but because his idiosyncrasy was such, that, in practice, aiming at the most absolute perfection, he was constantly altering his most elaborate and masterly designs super-

imposing one superb conception upon another, starting at incongruities that nobody else could see; and, often actually tearing down, what was already so well done, as to be almost unsurpassable. From this tendency to super-self-criticism, although his constructions are great and numerous, he did not accomplish near as much, as he otherwise would have done. And this peculiarity, becoming finally well known, somewhat impaired his professional honors and emoluments. For instance, he was deprived of the satisfaction of finishing the fine Abbey of Val de Grace, founded by Anne of Austria. This he had begun in 1645; and, when it was raised to the first story, the queen put it into other hands, in order to prevent its destruction by the one who had reared it. Having been chosen by the President Longueil, to erect his imposing *Chateau des Maisons*, near Saint Germain, when a very considerable part of it was erected, and that much to the satisfaction of Longueil, without acquainting the owner with his intentions, Mansart pulled it all down again, thereby quite disconcerting the president. Nevertheless, it must be allowed, with credit to the architect, that after this, he recommenced and finished the edifice in a style so noble, that it is accounted one of the choicest specimens of that

era. To convey this peculiarity of character, through a single circumstance, no better anecdote could occur than this: Colbert having addressed himself to Mansart for a design for the chief court of the Louvre, the latter shortly after presented the minister with quite a number of very beautiful sketches, any one of which alone, Colbert would have been perfectly content with; but, when Mansart was told, that he himself must fix upon one, to be followed invariably when adopted, our architectural worthy begged to decline the commission. The portal of the Minims, in the Place Royale, Paris, is his final work. He died in 1666, at the ripe age of sixty-nine.

FRANÇOIS had a nephew, JULES HARDOUIN, professionally educated by his uncle, who was also distinguished as an architect. JULES HARDOUIN-MANSART became a favorite of Louis XIV.; and, under his patronage, was enabled to realize an immense fortune. Hardouin-Mansart did not set hand to the work of extending and adorning Versailles, till 1674. As, after repeated solicitation, he could not obtain the consent of Louis XIV., to tear down the remnant of the hunting-box of his father, Louis XIII., he enveloped its walls in that magnificent structure fronting on the gardens. After his plans, arose, successively the little and the great stables, the south wing and the north wing; and France is also indebted to him, for the chapel at Versailles.

JULES HARDOUIN-MANSART was the most eminent architect of an age remarkable for the number of its eminent architects. He was the chief minister of the prodigious architectural expenditures of that great king, whose palaces exhausted the resources of France. The ribbon of the knightly order of Saint Michael, the offices of Head Architect of the Kingdom, and Superintendent of Buildings, Arts and Manufactures, besides his lordly income, were the reward of the builder of the palace of Versailles, the

erector of the dome, and finisher, of what afterwards became the hospital of the Invalides. Hardouin-Mansart's portrait by Philip de Champagne, is extant, upon the same canvas with that of Claude Perrault, to which latter we owe the colonnade of the Louvre. Besides Hardouin Mansart's operations at Versailles, some of his greatest works were the Chateau de Clugny, the house of St. Cyr, the gallery of the Palais Royale, and the Palaces de Louis le Grand and des Victoires. He died suddenly at Marly, in the year 1708.

The roof familiar to the France of the days of yore—older to the elder Mansart than his roof is to us—was the very lofty, steeple-like construction, sometimes conical, sometimes square; but always attenuated and always ending in a point, or a contracted, sharp ridge, and containing from five to seven, or even nine, low stories, from the eaves upwards, constantly diminishing in height. The traveler of to-day sees many specimens of this very picturesque, but extremely ungraceful roof throughout Normandy, the Ardennes, Luxembourg and Franche Comté.

The Mansard roof as invented by François Mansart, in the sixteenth century, has since undergone many modifications. The original form, as first introduced, was generally one story, but occasionally of two or more stories in height. In the latter case, the upper stories, in it were, constantly lower in proportion, ascending towards the peak of the roof; and the windows were small dormers, not much better than loop-holes, meant for a glimmering light in, and the ventilation of, stowage chambers, or mere lofts. The lower story in the Mansard, or, the first story above the main body of the structure, was always equal to and quite as desirable as either of those immediately beneath it.

The form and construction of these old French curb roofs are always such as to secure a plumb, or perpendicular

wall within the rooms, with a very trifling loss of space, the inclination from a vertical line, in the entire altitude of a story, being scarcely more than the thickness of the walls. There is much latitude in the cross-sectional forms, exterior decorations, &c. At times these roofs are of a very neat and yet very simple style of finish; and, again, of the most excursive and extravagant description,

But, with the modern style of the Mansard, employed on the first class buildings of the city of Paris and its vicinity, very few of the general imitations we have in this country will begin to compare. The same may be remarked in the comparison of our constructions, of this kind, with those of any other of the leading cities of France. We might adduce the *Place Pavillon*, projected by Napoleon le Grand; and carried out by the present Emperor, Louis Napoleon, which forms the connecting link, between the Tuilleries and the Louvre: and the elegant mansion, quite recently erected by the Baron Rothschild, in the suburbs of Paris. There are many others, of commensurate grandeur.

It is a singular fact, that this peculiar and ingenious style of roof never found its way any distance beyond the borders of France, excepting partially through the German states close to the line, until of late years, when it crossed the Straits to England. Then, in a double sense, we imported it to America. That is, our Mr. Sloan, designed for Dr. Evans; and put up at his residence near West Chester, Pa., in the year 1860, the first Mansard roof ever erected in this section of the United States. It became almost immediately contagious.

If handled with judgment, skill and care, the French roof will certainly be the means of beautifying our cities and their surroundings, although it is scarcely possible to an American city for generations to come, if indeed,—considering the government edifices, the public halls, the museums, art galleries,

zoological gardens, parks, promenades, and churches of the people,—ever to compare with the metropolis of France. We have, however,—spread all over the land, within the reach, and in the occupancy of the very humblest, as well as of all the intermediate classes, up to the very richest, and singularly enough, not in any degree dependent on the science and knowledge of architecture—a kind, and after all the most important kind of buildings, which they have not, and in all human probability never will have in the realm of the Gauls—those dearest to the inmates, and most inviting to friends and strangers, of all human habitations—homes.

Recurring again to our eaves, we have branched out, already, into a far greater variety of forms, than the French, in this matter of the Mansard roof. The transverse section of the original was all composed in straight lines. An examination of many designs in a late, and very choice, work, edited by "M. Cæsar Daley, *architecte du gouvernement*," shows nothing but straight lines in the framing of the roofs of any of his extremely ornate and beautiful figures; though we think curved lines occasionally greatly assist the stateliness and effect of the Mansard. We have the curve both convex and concave, the *cyma-recta*, and the *cyma-reversa*. When either of these last two forms is used, the height of the roof and the projection of the cornice are generally increased; and the window pediments are more broken in outline, and elaborate in decoration. In fact, departing from the original idea of an additional range of rooms with horizontal ceilings and walls *d'aplomb* without need of the supporting walls being very heavy, this roof is frequently carried up in the same material, as forms the walls, with highly finished balustrades, &c. The smaller windows are oval, and sometimes round, with exterior loopholes, for ornament. The chimney-stacks, carried up to a great height, are usually a marked feature.

Slate is commonly employed for the covering, with tin for all gutters and weathering.

Balustrades are very seldom omitted, in these roofs, by the French. This, one of the most salient and indispensable

characteristics, is entirely overlooked in most of the Mansards in this country. In visiting Paris, or any important French city, the differences between French French-roofs and foreign, or American French-roofs, are detected at once.

OUR SCOPE AND TENDENCY.

WE will here assume the liberty of a few remarks, concerning the employment of architects, in designing buildings and superintending their construction.

We remember having heard a gentleman, of much experience and known skill, state, at the time we undertook to publish the "Model Architect," that it was an addition to that class of books calculated to injure the profession to which we both belong. Had we entertained the same opinion, that work never would have appeared, no matter how desirous we might have been to improve the taste of the community. But, with as much propriety, might it be said, that the publication of a volume of sermons, would prevent those, who should buy it, from attending church, or that the reading of a family receipt-book would, in the event of illness, deter an application to a medical practitioner.

It is true, that a builder can understand the designs, details and construction of any edifice, so far as they are shown in the drawings, as well as the architect; and hence it may be said, that the cases above adduced, are parallel. To this cavil, we must enter our protest.

An untutored man—or even one who possesses a certain amount of practical knowledge, but is destitute of those advantages derived from the information, the knowledge and the experience of others—may assume infallible skill to cure all diseases; but no judicious person will, in the event of sickness, trust one of his family, or himself, in

such hands. There are also some builders, who pretend to the art of design, and, perhaps, honestly put forward their supposed capabilities, as if they really were equal, or superior, to the most eminent architects of the age. But no one, desiring to build with taste, will believe that they can be equally capable of designing, with the one, whose life has been spent, in gathering from the records and drawings of all ages, the principles and the combinations "fitting him to give forms of elegance and beauty to the abiding places of man." We may also observe, that it is only the man, who intends doing wrong, that can recommend the execution of any work, without the superintendence of an architect, except in those cases where professional skill cannot be obtained, without a disproportionate expenditure of capital and time.

For whom, then, we may be asked, is this work intended? and we reply, for the general reader, the gentleman, the architect, the builder, and the mechanic! It should increase the satisfaction of the general reader when he encounters technical descriptions. It will assist the gentleman in fixing on the style in which he will erect his domicile. It may aid the architect in designing. It must help the builder in construction. And it will certainly teach the mechanic details. At the same time, it might be the means of introducing a better style of architecture in those situations, where professional assistance cannot be obtained.

We are far from entertaining the opinion, much too common amongst professional men, that the publication of designs, with their details, will cause those intending to build to assume the role of overseer themselves, and to adopt some published sketch, which may happen to please the fancy.

The more the public taste is improved, the more demand will there be for the assistance of architects. It is a fact, which must have been observed by every one, that when a choice or tasteful building has been erected in any district, others of equal or superior preten-

sions arise, shortly after, at no great distance. Why? Because men of property begin to wonder, how they can improve their own residences, or stores, or churches; and the presence and skill of the architects are, of course, required.

Such, we hope and believe, will be the result of our work. As expressed in the very beginning, our aim is to make it aid in sowing and cultivating a taste for architectural design; and in the nearer future to cause many an elegant structure to be erected, on sites now mis-occupied by the baldest and barest walls of brick.

THE RESTORATION OF MOUNT VERNON.

IN the year 1859, the mansion of Mount Vernon, with all its permanent belongings, and two hundred acres of the Mount Vernon estate, surrounding and contiguous, by sale and purchase, passed, for and in consideration of two hundred thousand dollars, from the possession of John Augustine Washington, Jr.,* into that of the chartered "LADIES' MOUNT VERNON ASSOCIATION," Miss ANNA PAMELA CUNNINGHAM, Regent, representing the people of the whole United States. About one-fourth of the purchase-money was obtained by the individual efforts of the Hon. EDWARD EVERETT, of Massachusetts, by the repetition of his oration upon "the CHARACTER OF WASHINGTON," to select and patriotic audiences all over the country, and through the gift of the compensation he received from Mr. Bonner for essays contributed to the *New York Ledger*. The remainder accrued

from organized contributions, through direct donations, the sales of photographic and engraved views of the house and grounds, of canes from sticks cut upon the estate, and associated trinkets; and from the holding of fancy fairs.

The people, being at that time well aroused upon the subject, would have immediately proceeded to raise the means, then estimated at two hundred thousand dollars more, for the perfect restoration of the mansion, the out-buildings, the gardens and the general estate; as well as for their permanent future maintenance. But they were almost instantaneously called to the preservation of the more immediate legacy of Washington—their own inalienable inheritance from him—the integrity and liberty of the nation.

Whatever the method of raising the money, it came directly from the open hands of all the people; so, that, the entire object accomplished, the association might as well merge, by consent, in the government of the United States; the property to be held by it, for the people.

From the amount officially named as sufficient, we can gather, that the resto-

* The descent of Mount Vernon, by devise, was from George Washington to his nephew, Judge Bushrod Washington, son of George Augustine, the General's brother. Bushrod bequeathed it to his nephew, John Augustine Washington, son of the Judge's brother Corbin. After John Augustine's death, it passed to his widow Jane. On her demise in 1856, it devolved upon her son, John Augustine Washington, Jr.

ration of the mansion was to be a wooden one; for large sums, of course, would be needed for the plantations.

When the writer visited Mount Vernon in the year 1856, the process of insufficient, trivial patching was painfully evident, all about the exterior of the mansion. In one sense, every pilgrim aided the dilapidation. Visitors, in masses, were only admitted at a certain hour of the day, it is true; and that was regulated by the arrival and departure of the Washington city steamboat. But the constant treading of thousands of tourists, would soon utterly wear out the piazza and other floors, exposed to their feet. In addition to this, decay, from the weather-stress of many years, was making rapid progress upon the outside work. The pillars of the piazza had rotted away at the base; the weather-boarding of the house was dropping off; and the balustrades of the balcony roof of the piazza, and of the entrance porch, at the southern flank of the mansion, were fast disappearing.

All this, led us carelessly to remark to the captain of the steamboat, upon our return trip, that, however laudable in itself, if the process of patching Mount Vernon should continue many years, there would not be a solitary vestige of George Washington's Mount Vernon left; because a patch, even if the wood were raised upon the estate—which we did not suppose to be the case—could have no association with the original; and, in a very few years, the house would be all patches. But the worthy captain—perhaps inwardly startled at the thought of the loss of his vocation, or, at least, that of his successors, although he manifested no outward emotion—stoutly insisted, that, even if my supposition should, as an extreme case, fall true; and the entire residence should, in this detail patching, come to be composed of pieces of wood, none of which had ever been seen, or owned, by George Washington; yet, as long as the original form, color and

general appearance were kept up, it would still be the original Mount Vernon!

Our idea of the true restoration of this wooden abode, fraught with such important patriotic associations to the whole people of a great land and all their descendants forever—is this:

Employ the best professional talent. Survey very accurately the present location and bearings of the mansion, and all the buildings and divisions, at Mount Vernon. Measure and locate all the points of the exterior. Survey, with reference to the exterior survey, and measure all the interior portions of the mansion. Provide a temporary fire-proof building immediately at hand, for storage. Strip room by room, lettering and numbering every door and window-frame, mantle-piece, moulding, panel and board, as it comes away; and deposit the materials of each room, in a separate place, in the fire-proof repository, as above. Continue in the same manner, until the entire building is carefully torn apart, without splintering, lettered, numbered, packed away and properly secured. Then put a permanent guard upon the stowing premises.

In rebuilding, arrange so that the exact interior dimensions, position and relation of every room, hall, stairway, closet, window and door, shall be preserved. Make the foundations, throughout, deep and broad, and build up the cellar walls of large, well-squared and durable stones. Erect the walls slowly and carefully of well-burnt and well-shaped bricks; and, as the wall rises, carry up its outer, white marble casing, with occasional marble cross-joints or dovetails,* to secure the adhesion of the marble casing to the brick wall. Then construct the piazza floor and steps, its pillars and its ceiling; the southerly

* Known to architects and masons, as perpen-stones, parping-ashlars, perpeyns, bonders, bond-stones, or thorough-stones; the first term being applied to squared stones, or ashlar; bonders, also, do not always reach through a wall, but merely across part of its thickness.

entrance porch, and all its parts; the quadrant colonnades, and the story and a half offices on both sides of the mansion; all of white marble, to correspond. Let the roof be of white glazed tiles; and make the upper balustrades of well-galvanized iron. All the old interior parts would be inserted, piece by piece, in their respective places, as before; to be thenceforward carefully protected, as far as might be, from the influence of decay, by regularly recurring, thorough and careful applications of paint, varnish or oils, as the case should require. Then such of the authentic Washington moveable relics, as might be attainable, should be deposited in the apartments of this glorious old home. The summer-houses and other detached bowers, shelters, lodges, gateways, &c., would be renovated in a similar manner, replacing the frailness of wood by the permanence of marble and of galvanized iron. Then the old paths and, drives, the gardens and the conservatories should be replaced, in appearance as they were of old, with more substantial materials for the different parts. Finally: the plants known to be favorites of Washington and his immediate family, should reappear, in the spots where the General himself had them planted, or standing; and the forest should be managed, so far as its nature would permit, upon the same principle.

The reader will mark, that the whole

interior space of the dwelling would be as at first. That is, were the entire mansion to be dissolved into, and re-crystallized from air, its every interior part would occupy precisely the same atmospheric space, with respect to the soil of the homestead of Mount Vernon.

The very points of space, moved through and breathed in, by the Father of His Country, would be occupied and traversed by the honoring visitors, who would also have the same floors beneath them and the same wood-work around them. The one only difference would be, that to give the exact interior dimensions, would, from the nature of the new outer materials, render the exterior a little larger, though, at prospect distance, not perceptibly so, as the style and all the proportions would be accurately preserved.

Nevertheless, for all this, two hundred thousand dollars would be an entirely inadequate sum. A million and a half would be a much closer approximation. The American people, however, will cheerfully furnish the latter, or a much larger sum for this purpose, or any other great one, to keep them together. Woe to all factionists striving to rend them apart!

Such—and such alone—in our view—such, we hope, in the public view—would be a faithful, an enduring restoration, of the arch-patriot Washington's paternal hall and home.

A MORGUE FOR PHILADELPHIA has often been discussed and recommended in our public prints; but although our editors have discoursed both eloquently and feelingly, so far we have had to put up with the insufficient and miserable green-houses. We trust however, that the matter will not be suffered to rest, until a substantial and appropriate edifice shall be erected and consecrated to the sad and solemn purpose of decently displaying for recognition, the bodies of all those, at first unknown, unfortunates found dead from whatever cause. No matter how wayward, or how vicious the courses, leading

many members of the human family to unsheltered, unattended and, it may be, untimely deaths—and often these are the result of honest but over-sensitive misfortune, well worth the sympathies of of the proudest, or the purest—the unsepulchred and uncared-for corpse is a responsibility of enlightened Christian society and government, to be most tenderly kept. If, within a reasonable time, neither relative nor friend appears, then the remains claim decent burial from the general relationship of their former inhabitant with the great body of mankind. May the long-desired consummation soon be attained.

THE GAZETTE.

ABSTRACT OF IMPORTANT BUILDINGS ERECTING.*

BY ADDISON HUTTON.

For the Philadelphia Saving Fund Society. Banking Office, S. W. corner of Walnut street and West Washington Square, city. Style, Italian: massive. Material, granite; from the Quincy quarries, Massachusetts. Edifice, 51 feet front, 130 feet depth, height two stories. Interior arrangement most complete. All possible conveniences for the comfort of the officers and clerks.

For the Congregation of the Arch street Methodist Church. Church building, S. E. corner of Broad and Arch streets. Style, Gothic. Material, white marble, from the Lee quarries, Massachusetts. Edifice, front 75 feet; depth 99 feet 7 inches. Face, on Arch street. At the very corner of Broad and Arch, a tower and spire, height 220 feet 6 inches. A very imposing structure.

* [The above paragraphs exhibit the best style of wording notices for this department; short, pithy and index-like.—ED.]

BY SAMUEL SLOAN.

For Middletown, Del., Town Hall; in progress. Style, Italian. Material, brick, painted stone color, with stone dressings, &c. Edifice, front 68 feet, depth 70 feet, height three stories. First story, four stores, with a spacious entrance and stairway to the stories above. Second story, the Hall, with its dressing rooms, &c. Over the latter, an *entresol*, 14 feet by 45 for refreshment rooms, &c. Third story, two lodge rooms and a library. All commodious, well lighted and ventilated, with all the conveniences in all its apartments, necessary either for its stated or transient inmates.

For the Presbyterian Congregation of Bridgeton, N. J. A church; style, Gothic. Material, walls, light-colored stone, from Leiperville quarries, Delaware county, Pa. Dressings for doors, windows, corners, buttress-caps, and base course, brown stone. Width, 33 feet; depth, 100 feet; tower and spire, 165 feet high. On one flank a chapel, 53 feet wide, 60 feet long, connected with the church edifice by a vestibule 12 feet wide.

REMARKABLE QUARRY.

AGATE MARBLE.

A reliable correspondent gives us a brief sketch of a deposit of singularly beautiful marble, situated in Rockbridge county, Virginia, on the borders of North river, near the Rockbridge Baths, about 11 miles from Lexington and 9 miles from Goshen. A line of roadway from Goshen to Lexington gives the means of ready transportation to market; and this finely veined stone will

soon take high rank among the ornamental marbles.

The deposit is overlaid with some ten feet of ordinary limestone, and rests against a steep hill. To uncover the treasure is a work of much labor, but the superincumbent crust has already been removed a number of feet up the hill, and the mass uncovered about ten feet, vertically, on the north side, giving the general outline of an irregular boulder-shaped rock, which seems to extend

indefinitely downwards. What the entire area may be, cannot yet be ascertained; but enough is known, to prove that it must be large, and that the quality of the marble improves with the depth.

Messrs. STRUTHERS & SON, of this city, have polished a fine mantle-piece from the stone taken out of the upper part of the quarry, which specimen may be seen at their office.

The formation is evidently stalagmitic, that is: deposited, drop by drop, from above; and when the high polishing of which it is susceptible has brought out the grain, the surface appears in waves, drops, feathers, clouds and radi-

ations of all sorts, in which brown and creamy tints of surpassing beauty are blended.

From its variegated and semi-transparent character, this mass of compact stalagmite, which is an almost absolutely pure carbonate of lime, has been called by the Messrs. Struthers, AGATE MARBLE. It is as easily worked as the Italian; and admits of a much higher polish. As it lies in a very large body, blocks of any given dimensions can be had. The prevailing color is a rich deep "raw sienna." The reader will observe that it belongs to the same county with the Natural Bridge.

IMPROVED SASH-WEIGHT.

THERE has lately been introduced into this city by ROGERS, OLDERSHAW & Co., of the *Fairmount Iron Works, Philadelphia*, a sash-weight, with sufficient merit to bring it into universal use.

A sheet-iron or other metal case is filled with the slag or black cinder, from furnaces and rolling-mills, the whole being coated or japanned, to render it smooth and prevent rust.

All shapes and sizes are manufactured. Two shapes being adopted as the standard ones for the hardware trade, round (a) and oval (B). The round answering the purpose of all the old square weights, and the oval supplying the place of the old flat weights.

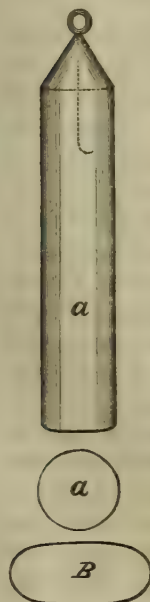
As these improved weights have no square or sharp-corners or burrs,

always inseparable from the old style weights, and are rounded on the bottom, sliding freely, they cannot jam in the boxes. The eye being deeply fixed in the cone-shaped head, as shown by the dotted lines in the cut, cannot pull out or break off, and this compels the weight to hang plumb. The iron cases protect these weights from fracture. They are uniform in size and shape. They are sold retail at the wholesale prices of the old weights. These and other considerations recommend them to builders as the most desirable weight in the market.

Sash, dumb-waiter, clock, and all dead-weights, are included in the manufacture.

The above cut hardly gives the true idea of rounding up the bottom of the weight. It appears rather more like the perspective of a flat-bottomed weight.

We think, however, that, between the cut and the description, the true idea must be obtained by the reader.



DESCRIPTIONS.

DESIGN FOR A CITY STORE, IN WHITE MARBLE,

ERECTED IN PHILADELPHIA:

OWNED AND OCCUPIED BY SAMUEL S. WHITE.

WE herewith present the front of a store situated at the southeast corner of Twelfth and Chestnut streets, designed, and lately completed, for the projector and owner, our quiet, unassuming and much esteemed fellow-citizen and friend, SAMUEL S. WHITE, Esq., who, in addition to the marked improvements he has introduced, and is still introducing, in his own department of American manufactures,—namely: Artificial Teeth, and all Articles appertaining to Dentistry,—wherein he is confessedly ahead of all competitors in any country—is ever ready,—when forced to amplify previous business accommodations, or, as in this case, fairly to remove for the sake of more space and greater facilities,—to afford the practitioners of other arts an opportunity of exhibiting their tasteful adaptation to his requirements.

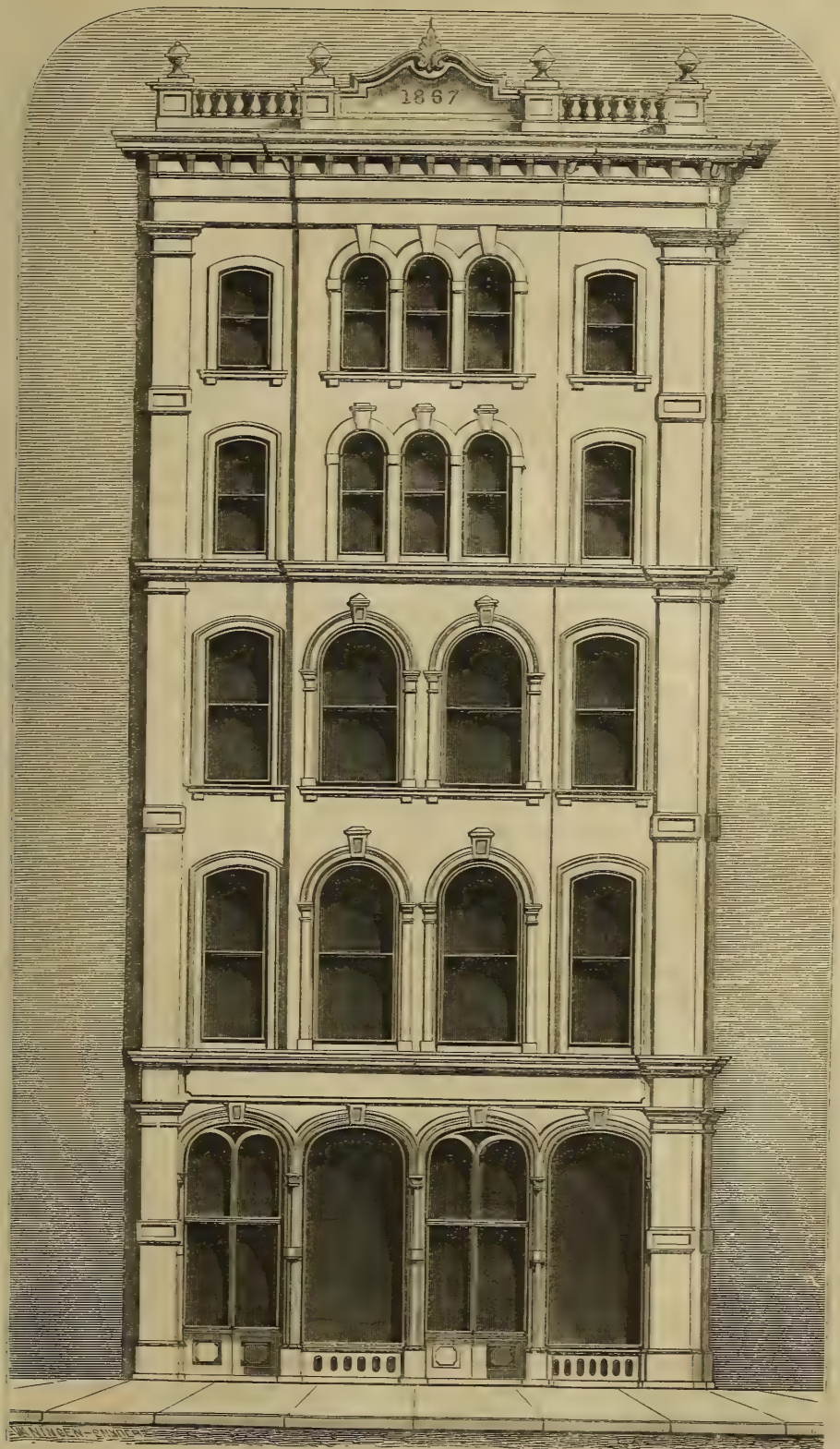
The elevation in hand, being of pure white marble, though exceedingly simple, almost severe, is, from the material, very pure and rich. We find nothing which could enhance the effect designed and obtained, save an upward continuation of the return of the marble, throughout the whole width on Twelfth street, that it occupies on the first story, the part leased of Mr. White, for a long term of years, by Messrs. BAILEY & Co., JEWELLERS. And in passing, we may be allowed to glance hurriedly at the great forecast, research and assiduity of this firm, from the old

days of Bailey & Kitchen to the very instant, resulting in a large and ever-changing stock, gathered from all the best workshops and studios of Europe and America; and in a reputation deservedly as high as it is far-spread. It is really cheering to note the faith, both of the energetic owner and his indefatigable tenants, strikingly indicative as it is of that spirit, which, we trust, will ere long bestow upon Philadelphia such a profusion of well-planned and chaste structures, for domestic life, business, or public use, as shall at once be worth the eye, the tongue, and the pen of the genial and able critic.

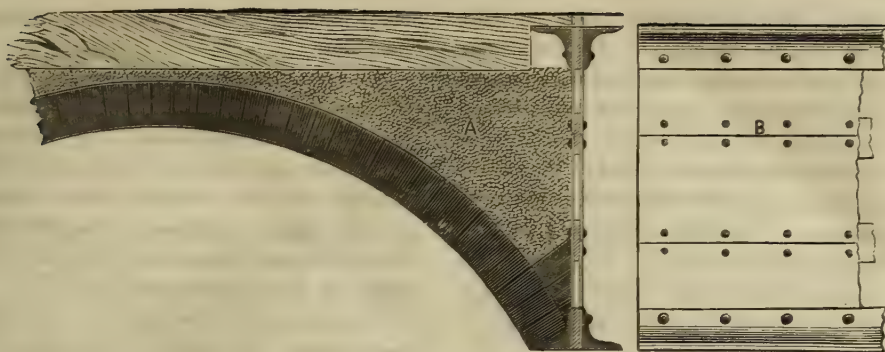
This structure, forty-four feet front on Chestnut and Sansom streets, by two hundred and thirty-five feet depth on Twelfth street, is five stories high throughout, with a basement story and vaults beneath the pavement.

The front on Chestnut street is of white marble from the Manchester quarries, State of Vermont. The Twelfth and Sansom street fronts are faced with pressed brick of the best quality, with white marble trimmings to the doors and windows.

The body of the interior is rendered thoroughly fire-proof, by means of compound wrought-iron beams, that span the entire width of the building, with no supports to interrupt the clear space. These beams, which will upbear 155 pounds to the square foot,—at six tons per square inch tensile strain, for all the iron in the flanges brought



DESIGN FOR A CITY STORE, IN WHITE MARBLE.



under tension—without the slightest appearance of flexure, and all the other iron work, beyond mere hardware, were manufactured by the PHOENIX IRON COMPANY OF PHILADELPHIA. The first floor is constructed with the ordinary nine-inch iron beam, bearing on a girder composed of one fifteen-inch beam, upheld by columns throughout the basement. These beams, placed four feet apart, are connected by tie-rods throughout the whole length of the building, and all are filled in between, transversely, by segmental brick arches, of five-inch perpendicular rise from their chords, one brick in thickness; and filled up to the crown with concrete and mortar, affording a level surface to receive the marble flooring-tiles. This entire floor is laid with marble, and fitted up with marble counters, &c. The ceiling is frescoed in the most appropriate and artistic manner. The interior windows and doors are all finished in walnut wood and glazed with the best French plate glass. The principal openings on Chestnut street, with one in the return on Twelfth street, are closed up with Badger's Improved, Revolving, Iron Plates.

The remainder of the side windows, and those on Sansom street, are protected by wrought-iron guards, of neat design, all bronzed. All these openings have inside pivot-blinds, made of walnut wood, and folding into soffits, provided, in the jambs, to receive them.

The rear end, or the Sansom street

front, of the lower story, is arranged for the counting-rooms of Messrs. Bailey & Co., with private apartments for the most valuable articles of jewelry.

Along the rear, on Sansom street, this story is divided in its height, *a l'entresol*, in order to obtain work-rooms for fashioning certain kinds of articles, whose places of manufacture is necessarily kept in close proximity, and immediately under the eye of the proprietors. This story, twenty-one feet high in the clear, is well adapted to the above arrangement. These private apartments are all separated from the main body of the store by an arcade, resting on scagliola columns, very naturally representing the finest Sienna marble, manufactured by Mr. THOMAS HEATH, of Philadelphia, who has become quite celebrated in his elegant art of verisimilitude, and is, perhaps, not excelled, in his particular branch, by any artist in this country.

The stairs leading to the second story from Chestnut street are of white marble; and two flights in the rear, or from Sansom street, are of walnut. All these stairs connect with the four stories that are occupied by Mr. WHITE, as his DENTAL DEPOT. The flight from Chestnut street communicates with his offices and sales-rooms.

In addition to the several stairways, there is a lift, operated by steam, which is at all times in readiness for its task of conveying goods from story to story, or of receiving raw materials and discharging the finished products of the

place. This lift extends from the fifth story to the basement. In the latter are the furnaces, boilers, steam-engine and machinery; and also work-shops for certain classes of work. About two-thirds of the basement, and of the vaults on Sansom and Twelfth streets are thus occupied. The other portion is held by Messrs. BAILEY & Co.; and connects, by a convenient and commodious staircase, with their grand apartments on the ground floor.

The heating of the entire building is done by steam, partly by direct radiation in the respective rooms, and partly by warm air conveyed to the apartments by means of flues; and all produced by

steam coils and radiators placed in the basement.

The iron beams throughout all the stories, except the first floor, as already described, are compound, $27\frac{1}{2}$ inches deep; and placed 8 feet 1 inch to 9 feet 10 inches between centres, with a brick arch of single thickness, strengthened by a compound hunch on each side, between them, as represented by fig. 1.

Description of the figure: AA, the iron beams; B, soffit of the arch; C and D, hunches, forming the compound hunch on either side; E, crown of the 4-inch arch; F, the open space, or the cross-wall; GGGG, sleepers; and H, the floor.

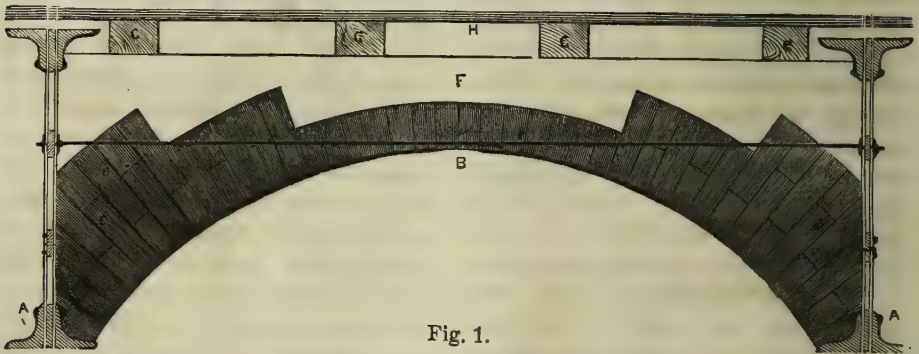


Fig. 1.

These beams are clamped together by iron rods, to prevent any lateral thrust from the arches, throughout the entire length of the building. Across the arches an 8-inch wall is run every 6 feet, the object being to lighten the weight. On top of these walls, 3 by 4 inch sleepers are laid, 16 inches apart, to receive the flooring. All the floors, above the first, are of Southern, or true yellow pine, which is best adapted to the special use for which the building was designed.

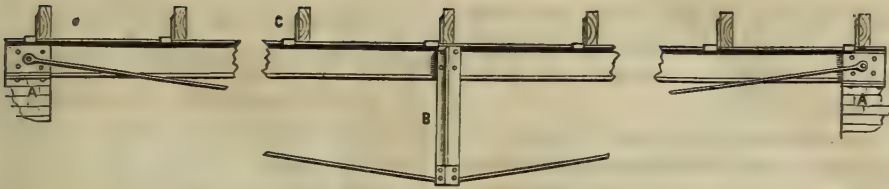
The roof is constructed of iron framework, as in figure 2, and covered with tin.

AA are the side walls of the building. B is the suspension-brace in the centre of the cross-beam. C, the furring-piece upon which rests the rough boarding for the roof. These pieces are secured by angle-irons to the beam. The boarding

and the roof itself are not represented in the cut. Running through the foot of the suspension-brace B, to the head of the walls, at AA, are the suspension-rods, secured at either extremity, as depicted in the figure.

In Fig. 3 are the several detached parts of the above drawn to a larger scale. A I is a transverse section of the brick wall on which rests the end of the iron beam, here given in longitudinal elevation, with the end fastening of the connecting rod, the same at either end of the beam. B, a cross-section of the beam, and also the suspension-brace, showing at the top, in longitudinal elevation, the part of a furring-piece having the complete angle-iron fastening; and, at the bottom, the insertion and adjustment of the suspension-rods. C, longitudinal elevation of the iron beam, with

Fig. 2.

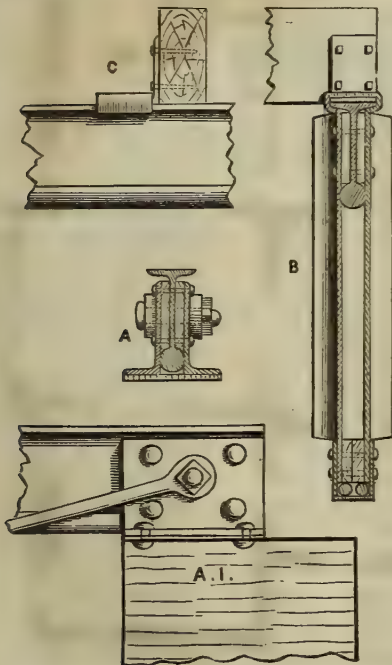


transverse section of the furring-piece and angle-iron.

The furring-pieces and the boarding are the only wood entering into the entire construction.

The cornice is of galvanized iron, executed and put in place by J. P. STIDHAM & Co., of Philadelphia. These gentlemen deserve much credit for perfecting this particular branch of their business, after much experiment and outlay. They are now able to produce the most perfect forms, moulded, or in brackets, and adapted to any design and style.

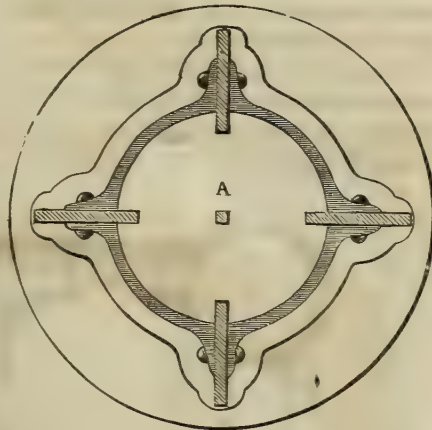
Fig. 3.



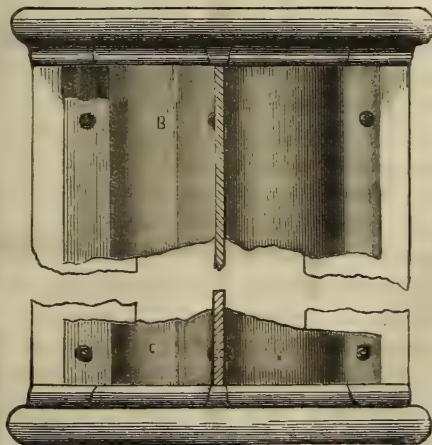
The columns in the basement are of a peculiar form, made of wrought iron in four quadrant sections, with flanges, bolted together; and can be increased or diminished, both in size and substance,

according to the weight they are to sustain. We here present a section, fig. 4; with cap and base, No. 4; and shaft, No. 5.

Fig. 4.



No. 4.



No. 5.

The whole building and appurtenances are as near fire-proof as circumstances would admit, in adapting all to the needs of the owner, whose own spe-

cial views and wants were particularly conformed to, in the design and construction, which combine all the proposed conveniences necessary for those wants.

As a matter of curious interest, we would say, that there are 500,000 bricks in the arches, each brick, with its mortar, weighing six pounds: thus these iron beams support a weight of 3,000,000 pounds. The walls of the building contain 1,500,000 bricks. This makes in all 2,000,000 bricks. All the brick work was done under the superintendence of Mr. GEORGE CREELY.

We are free to say that the example is one, which we hope to see emulated, in future improvements for business purposes, whether in this city or elsewhere.

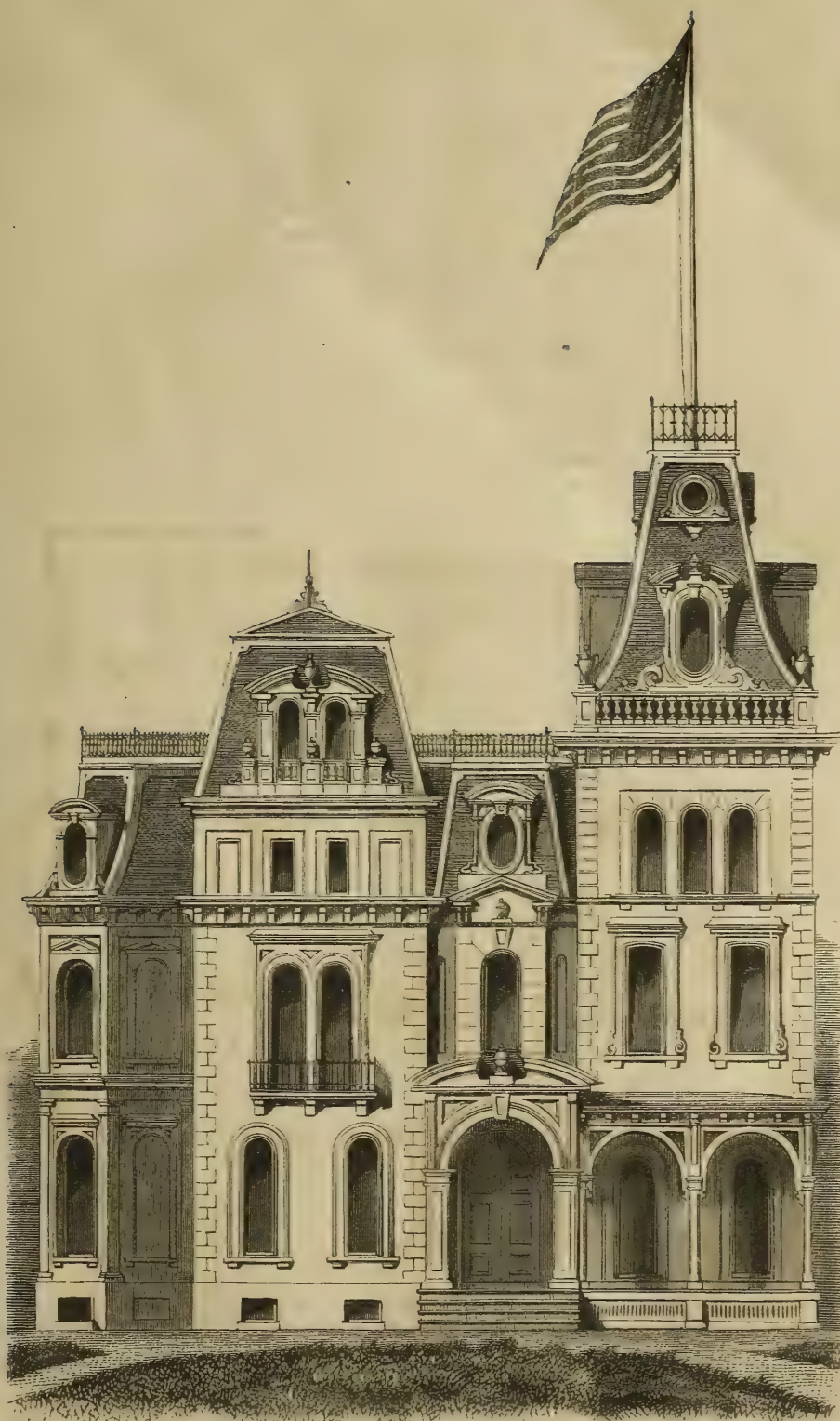
ELEVATION OF A SUBURBAN VILLA.

STYLE: FRANCO-ITALIAN.

THE elevation here presented may be entitled suburban, on account of its adaptedness to the ampler lots away from the heart of the city. It is broken in outline; and partakes of the Italian style in all its leading features, save the roof, which is French, somewhat modified in outline from the original form, invented and introduced by Mansart, in the beginning of the seventeenth century. This has been the prevailing roof in France ever since that period; and of late years has been introduced into many sections of this country, particularly in Boston and vicinity.

Description of the plan: A, the vesti-





ELEVATION OF A VILLA: STYLE. FRANCO-ITALIAN.



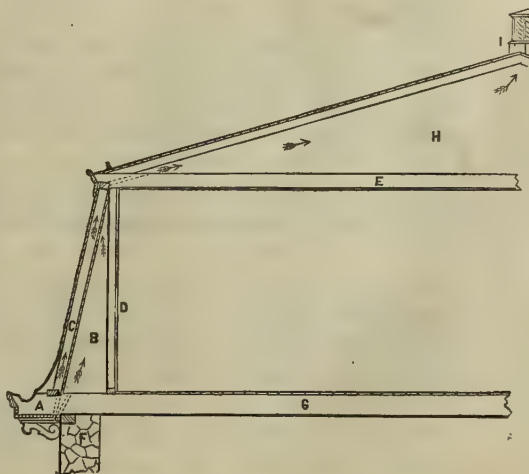
bule, oval in form, with four niches, 10 × 16 feet; B, the centre hall, 15 × 18 feet; C, the stair-hall, 15 × 22 feet, which contains the main stairway; D, the sitting-room, 20 × 20 feet; E, reception-parlor, 20 × 22 feet; F, the drawing-room, 18 × 35 feet; G, the dining-room, 20 × 32 feet, with recess for sideboard, T; H, library, 16 × 20 feet; I, alcove in the same; J, study, 12 feet diameter; K, lavatory; L, private stairs; M, butler's pantry, 11 × 12 feet; N, water-closet; O, ladies' boudoir; P, front porch; Q, covered balcony, connected with the library and study; R, dumb-waiter, in the hall that contains the private stairs; S, closets.

The kitchen and the other servants' offices are placed in the basement; and their dimensions must of course be arranged according to those of the rooms above.

If the idea of such a basement be carried into execution, in the fitting up and furnishing of these domestic offices, a thorough system of ventilation should also be introduced, as nothing can be more annoying to persons of delicate olfactory organs than the various effluvia arising from the culinary department of the offices; and, indeed, the comfort of the entire household much depends upon the arrangements there adopted. Many persons imagine that the method of finishing these humbler rooms is of such slight importance, that, if a reduction is to be made in the estimated price of the building, the difficulty is almost always met by the selection of inferior materials and common workmanship for this department of the building. We are, however, of the opinion that, if any part of the house must be more carefully found and finished than another, it should be the kitchen and domestic offices.

Great care should be taken in the preparation of the subsoil, to insure perfect drainage, in order to prevent any tendency to dampness, which, of course, must always be an important matter for consideration and avoidance.

We hear frequent complaints of the heat felt in all chambers immediately beneath the roof, in their respective buildings, more especially where a transverse section shows flatness, or an obtuse angle at the ridge pole; and the prolonged temperature, inducing these complaints, rises as we approach the hither boundaries of the Southern States, being greatest wherever slate is used for the covering. This arises either from faulty or cheap construction; and the defect may readily be remedied in practice by forming double air-chambers, or ducts for the passage of a current or currents of air, one of these ducts, or conductors, to be fed from small openings beneath the cornice and through the upper edge of the bed-mouldings, and the other within panels in the frieze, between the modillions or brackets. When no brackets are used, which is sometimes the case, the openings to the inner duct can be arranged along the lower edge of the bed-mouldings. The air is thus conveyed to the loft, within the upper section; and thence escapes through regularly constructed ventilators. The annexed figure exhibits a section of the form applicable as well to any Mansard roof as to that of the message of this exposition.



A, the cornice; B, the inner air-chamber; C, the rafter, and outer air-

chamber, with the under side boarded up closely, to form the air-chamber between this and the outer boarding that is covered with slate; D, the ashlar, with vertical studding; E, the joists; F, the wall; G, the ceiling joists; H, the upper loft; and I, the ventilator, through which the air escapes. This latter can be dispensed with, when chimneys are in or near the centre of the house, as additional flues can be constructed for this special purpose.

A few dollars, or a few hundred, according to circumstances, spent upon the ventilation of a dwelling would always augment the comforts and often extend the lives of the inmates.

The writer knows the case of a gentleman of this city, not many months deceased, who was aware of his own impending danger from chronic pulmonary disease, yet, by his thorough disposition for ventilating his residence, is credited, by his more intelligent acquaintances, with having prolonged his life ten years, to enjoy the society of his family and friends.

A DOUBLE RESIDENCE: IN THE ITALICO-FRENCH STYLE.

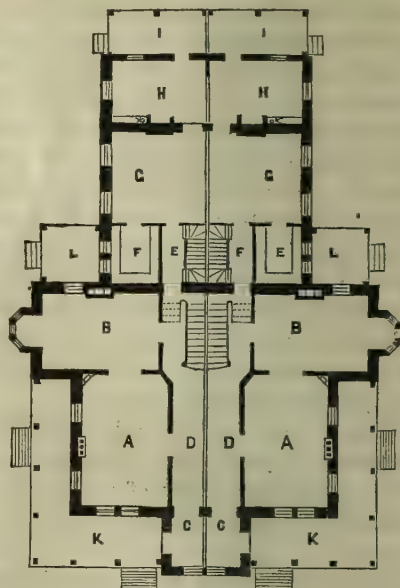
REVERSING the preponderant aspect, we now give a brief description of a block of two dwellings, so designed and arranged as to represent one residence, and well adapted to the neighborhood of a city where land is to be had at a moderate price.

The lot for each house should not be less than 50 feet front and 200 feet deep, although we have frequently built them on 40 feet front.

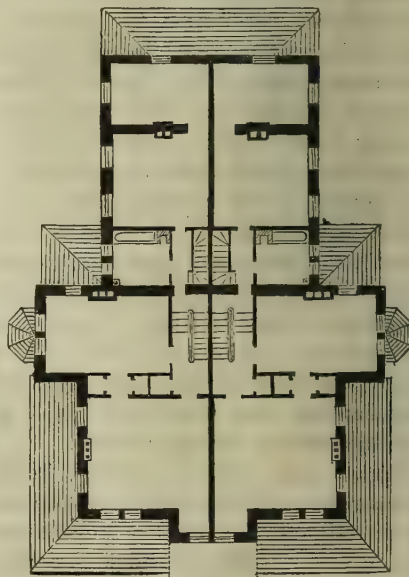
A glance at the plan will explain the arrangements and accommodations.

First story: A, is the parlor, 16 × 24 feet; B, sitting-room, with bay windows, 15 × 20 feet; C, vestibule, 5 × 8 feet; D, hall, with main staircase; E, private stairs; F, butler's pantry, 7 × 9 feet; G, dining-room, 15 × 17 feet; H,

kitchen, 15 × 13 feet; I, back porch; K, front porch; L, side porch.



The second story has three chambers, with a bath-room over the butler's pantry and a library over the kitchen, large wardrobe-closets, and all other conveniences, necessary for the comfort and ease of the occupants.



The stories above have a similar arrangement, except a store-room, in



A DOUBLE RESIDENCE: STYLE, ITALICO-FRENCH.

place of the bath-room, and a chamber, instead of the library.

Altogether, there are eleven chambers, all of which are spacious, well lighted, and thoroughly ventilated.

The entrances are so placed as to make them entirely private.

Our full page engraving represents the main front, which has three stories and an attic formed within the French roof. This elevation is continued to the rear of the sitting-room. Beyond this, the stories—also three in number, with an attic—are on a level with the half-landings of the main stairs.

Altogether, this bi-conjoined residence, although not so truly in accord with ultimate architectural principles, as if it only afforded a home for one family, will yet yield two good abiding-places to two good neighbors.

THE THIRD PRESBYTERIAN CHURCH, PITTSBURGH, PA.

THE congregation of the Third Presbyterian Church, at Pittsburgh, have just completed their new edifice, situated on Sixth street, near Grant.

The plans for the new structure were matured in the winter and spring of 1864-5; and the work was begun early in the latter season.

It was discovered, after the commencement of the excavation, that it would be necessary to use extra precautions, to secure a permanent foundation and especially at the corner where the tower stands. This portion, after examination, was found to require a cutting of from thirty to thirty-two feet in depth, to reach a stratum that would warrant permanency. To obviate this difficulty, it was requisite to drive piles, which was accordingly done.

The piles, from ten to twelve inches in diameter, were driven to an average depth of thirty-two feet, and were not allowed to be more than eighteen inches apart, over a surface of forty feet square. This included the projections of the

buttresses and the footings beyond the tower walls. The piles were then all cut to a level surface, two feet beneath the bottom of the cellar, and the earth removed from between them, three feet in depth. The entire cavity thus formed was carefully filled with concrete, closely packed and thoroughly cemented, until it reached the general level of the pile-heads. This whole artificial surface was then covered with three courses of heavy stones, from five to six feet long, completely bedded in cement. Upon the upper course was commenced the regular masonry, which was all methodically bedded, and clamped with iron at intervals, until it reached its limit, at the base of the spire.

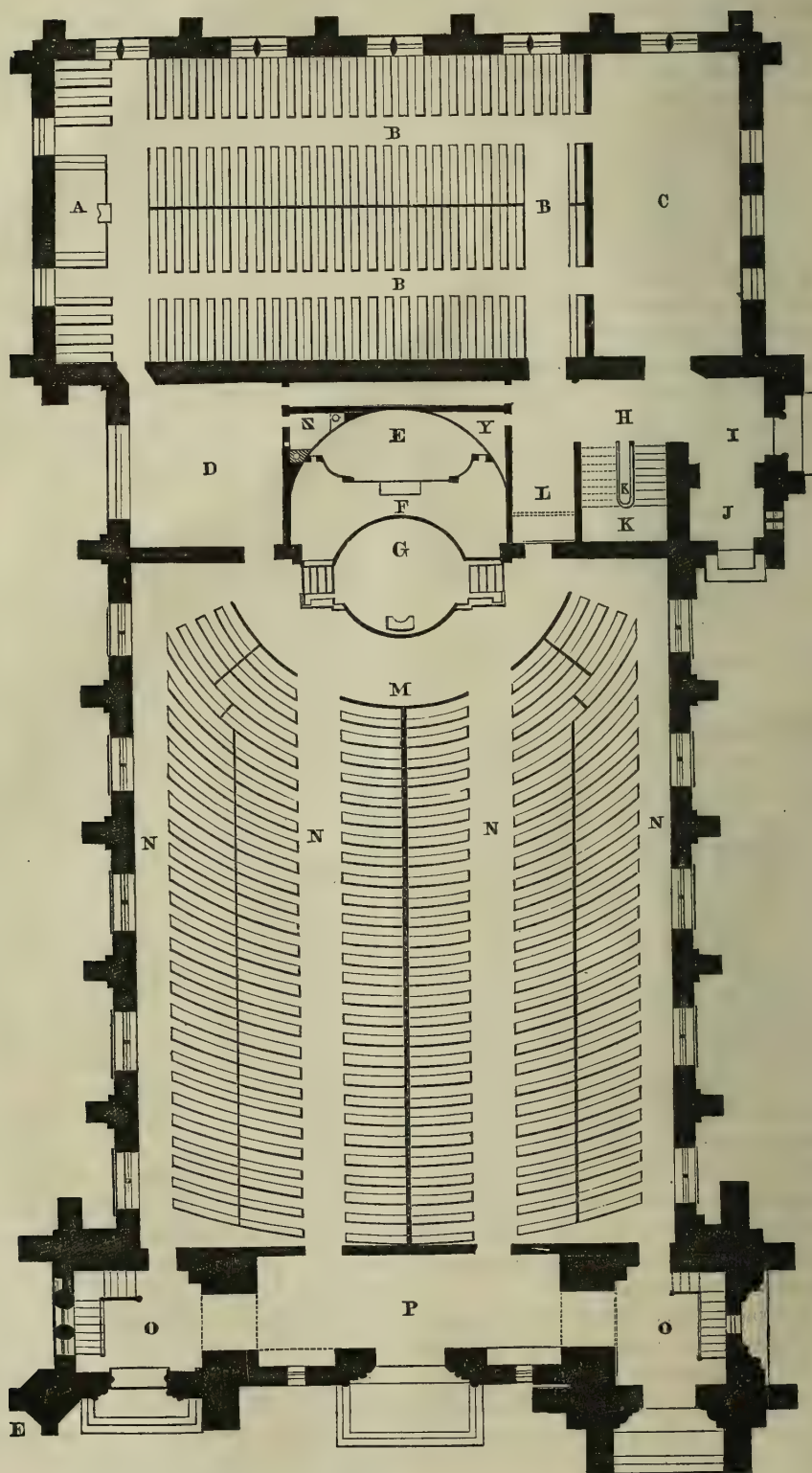
The entire length of the building, including the chapel, is one hundred and ninety-three feet; the width, one hundred feet, including the buttresses.

The audience room is ninety feet long, seventy feet wide, and fifty-two feet high to the most elevated point in the ceiling. A gallery is formed over the front vestibule, the front of which is curved to what is usually termed the horse-shoe form, and is capable of seating two hundred persons. The main floor of the auditorium has one hundred and sixty pews; and will seat comfortably eight hundred and sixty persons.

The organ loft and choir are in the rear of the pulpit. The whole interior of these inseparable divisions, including the organ case, is fitted up with black walnut, oiled and unvarnished.

The vestibule is laid with encaustic tiles of neat design.

The entrance doors are all of walnut, and are hung with ten-inch double-jointed wrought-iron butt-hinges, with bronzed straps. Of these latter, which, together with the escutcheons, are antique, and in the Norman style, we give an illustration: No. 1, strap to the centre door; No. 2, the escutcheons and rings to the same; No. 3, straps to the doors of the side porch; No. 4, the escutcheons and rings of the same on a longer scale.





THE THIRD PRESBYTERIAN CHURCH AT PITTSBURGH.



They are very artistically executed by Messrs. FIELD & HARDIE, Philadelphia. These gentlemen deserve much credit for the science and skill displayed in the production of fine specimens of bronzed metal.

In a future number we shall present

an essay on church, cathedral and sepulchral brasses, bronzes, &c., which will enable us to enlarge as well upon the mediæval work as the modern artistic imitations of it, measurably to do justice to the taste of our townsmen, and to incite projectors to pay some little attention to these congruous accessories for harmonizing—while they heighten the effect of—true architectural materials and good work.

The chapel is ninety-five feet long, forty-two feet wide, and two stories high. The first story is a lecture-room, with ladies' vestry; and the second is devoted to Sunday-school purposes, including library, bible-class rooms, etc.

The pastor's study is between the audience-room and the lecture-room, connecting with both.

The Sunday-schoolroom is approached by commodious flights of stairs.

The general arrangement of the entire edifice is as follows, beginning in the chapel: A, the pulpit; B, the aisles; C, ladies' chapel; D, library; E, organ; F, choir; G, the pulpit floor, or dais; H, I, L, lobby, or passage; J, vestibule; K, stairs to school-room; M, auditorium; N, aisles; O and P, vestibules.

A HOME WITHIN A PARK.

ON taking up a newspaper, in a momentary pause from our architectural labors, we were struck by the following query and answer of, and to, a visitant at a country cemetery:

"Do people die often, out here?"

"O, no! they only die once!"

Our faculties being much occupied, at the moment, by a magnificent enterprise, to wit, the preparing, professionally, of forty or fifty designs for residences, combining every conceivable elegance, or comfort, as homes, to be erected within the beautiful estate known as REDLEAF PARK, near Philadelphia, upon

the general idea of that of Llewellyn Park, at Orange, near New York city—this anecdote gave fresh impetus to our previously conceived ideas of the value of the opportunity, thus afforded us, through which we could aid, in greatly prolonging the lives of the prospective occupants of our Park, and also in providing each with a round of delightful enjoyment—the very opposite of the "living death," it has often become, both morally and physically, in our reasonably healthy, but yet pent-up city, which, however, while it compares very favorably with all the great metropolitan

centres, throughout the world, must, nevertheless, we are forced to admit, most miserably fail when compared, in regard to salubrity, with this Montgomery county upland.

In the erection of our architectural creations hitherto, we have generally been restricted or limited, in various ways; but as herein was presented to us an unrestrained field, congenial to our tastes and inclinations, and amply adequate to revivify all of our past architectural experience,—in combination with scientific discoveries, bearing upon health and comfort,—it might reasonably be expected largely to conduce towards the continual tasteful enjoyment of life within doors and without.

The public generally are, it is believed, unaware, that, on Lancaster avenue, within the distance of not more than five or six squares from two stations on the Pennsylvania Central Railroad—"Overbrook" and "Wynnewood," five and six miles from Chestnut street bridge, a tract of land of surprising natural variety and beauty, containing about two hundred acres, was, some fifteen to twenty years ago, embellished as a Park—without regard to expense—by James Hogan, who had previously been, for several years, in a position second only to Sir James Paxton, as landscape gardener, at Chatsworth, England, the famous estate of the Duke of Devonshire.

The plantations are now of large size; the trees most luxuriant in growth, and, in combination with the original forest-groups, woods, water-surface, near and distant views, exhibit proofs of masterly skill and judgment. The whole Park has, we may say, the charm of unexampled, almost infinite, variety and beauty.

Here, in about twenty minutes time from Chestnut street bridge, at an elevation of some four hundred feet above the city, the most perfect healthfulness of atmosphere is reached. The subsoil being of gravel and sand, there are no

malarious exhalations; and it is stated by residents of eighty to ninety years of age, that bilious and typhoid fevers have never occurred in its vicinity.

A large map is being prepared by us, showing the locations, together with drawings, of exterior and interior appropriate styles of buildings from cottage to castle, which will be completed according to plans and specifications, within certain dates, for low and reasonable sums named.

All occupants of these homes may obtain the use of the avenues for pleasure-driving. Elm avenue is of about two and a half miles in extent, by forty feet in width, the trees affording delightful shade throughout.

The hedge-rows, of maclura, double althea and rose, are ten to twelve feet in width.

The supply of pure water is most abundant.

It is intended that only wire division-fences shall be used; and that all offensive, unsightly out-buildings shall be interdicted within the Park.

We have no doubt, that many a thing which the present outline would indicate as a practical appliance for an elegant round of enjoyment in home life, as pure invigorating atmosphere, and beautiful landscape embellishment already perfected—has been the longing—the hope—yes, the stay and support of many a business man, and the promised goal of his ambitious toil. A superb Park, residence and surroundings, in prospect, have charms for the most practical; but practically and single-handed, these involve enormous expense; and are only attained, probably, too late in life.

Under our proposed plan, all this can be entered upon, by longing admirers of country life, at an early day. The project, in fact, affording, relatively to city residences, not only economy of money, but giving energy, health and vigor; the investment becoming literally the grand entrance to an avenue of incessant gratification and a home of ease.

LENGTH AND NUMBER TO THE POUND OF READING NAILS.

The reader may rely upon the following very useful table, as an absolute authority. The modest note of our friends, Messrs. FIELD & HARDIE, hardware merchants, of No. 633 Market street, omits one very important fact, namely: that the members of the firm, in every instance, made the count and measurement with their own hands.—
EDS.

PHILADELPHIA, July 18, 1868.

SAMUEL SLOAN, ESQ.:

DEAR SIR: Annexed please find a table showing the length of each size nail, brad, and spike; also the number to a pound.

Very respectfully, &c.,

FIELD & HARDIE.

CUT NAILS.			FINISHING NAILS.			FLOOR BRADS.		
Size.	Length. Inches.	Number to the pound.	Size.	Length. Inches.	Number to the pound.	Size.	Length. Inches.	Number to the pound.
2 ^d	$\frac{1}{8}$	960	4 ^d	$1\frac{1}{2}$	386	6 ^d	2	144
3 ^d fine	1	725	5 ^d	$1\frac{3}{4}$	290	8 ^d	$2\frac{1}{2}$	106
3 ^d	$1\frac{1}{16}$	405	6 ^d	2	220	10 ^d	$2\frac{3}{4}$	80
4 ^d	$1\frac{1}{4}$	260	8 ^d	$2\frac{1}{2}$	137	12 ^d	$3\frac{1}{8}$	61
5 ^d	$1\frac{5}{8}$	188	10 ^d	3	88	CLINCH NAILS.*		
6 ^d	2	138	12 ^d	$3\frac{1}{4}$	67	Size.	Length. Inches.	Number to the pound.
7 ^d	$2\frac{1}{4}$	130	SPIKES.			6 ^d	2	158
8 ^d	$2\frac{1}{2}$	93	Size.	Length.	Number	8 ^d	$2\frac{1}{4}$	96
10 ^d	3	69	Inches.	Inches.	to the	10 ^d	$2\frac{1}{2}$	62
12 ^d	$3\frac{1}{4}$	57			pound.	12 ^d	3	41
20 ^d	$3\frac{1}{2}$	38	4	4	16	FENCING NAILS.		
30 ^d	4	26	$4\frac{1}{2}$	$4\frac{1}{2}$	12	Size.	Length. Inches.	Number to the pound.
40 ^d	$4\frac{1}{2}$	20	5	5	9	8 ^d	$2\frac{1}{4}$	54
50 ^d	$5\frac{1}{2}$	13	$5\frac{1}{2}$	$5\frac{1}{2}$	8	10 ^d	3	46
60 ^d	6	10	6	6	6			
			7	7	5			

* Often termed wrought nails.

THE CHARACTER OF AN ARCHITECT,

WITH REFERENCE TO THE LIFE AND VIEWS OF

MARCUS VITRUVIUS POLLIO.

ALTHOUGH there may be occasional exceptions, yet it is true, in the main, that any man highly and deservedly distinguished in any branch of literature, science, or art, will be well informed upon almost all subjects. This arises from the very nature of the circle of knowledge, the relationship and intercommunication of all whose divisions are such, that he who really masters one, must, in the effort, become pretty well acquainted with most of the others. Any degree of the circle leads, imperceptibly, to all the rest. Thence it follows, that the neophyte of good natural ability, may make a tangential approach; but it is quite surely converted into a circumferential sojourn. Yet, while the tyro, in any department, is invariably told by the lecturer, or informed by the author, in every variety of phraseology, that "every beginning is difficult," he generally finds, that nearly all the difficulty is in the beginning, which over, it is really easier for him to proceed than to stop. As, though, ability, disposition, leisure, means and opportunity must concur, great men are few; but, relatively, great men, only great in one direction, are fewer. This is acknowledged, at least tacitly, by nearly all professional writers treating upon eminence in their own specialties, and is sometimes openly claimed. It springs, probably, from the innate tendency of man rather to overestimate than to disparage greatness, if not coeval, and "to magnify his office."

It is none the less true, that the thorough, creative architect must be possessed of sound memory, large native capacity, great breadth of imagination and unwearied industry, to attain the multi-commingled knowledge

and information, the keenness of eye and the accuracy of hand, which constitutes the professor, the master. These positions are well exemplified, both in what little of a personal nature remains concerning Vitruvius himself, and in his own first chapter, which is really the embodiment of his *beau idéal* of the character of the model architect.

Marcus Vitruvius Pollio, known to the moderns as Vitruvius, was a Roman citizen. We know nothing certainly of the time or place of his birth. He mentions incidentally, in his treatise, that Caius Julius, the son of Masinissa, who was an officer in the army of Julius Cæsar, lodged with him; and, from the dedication of his work, Octavius Cæsar was his patron. It is presumable, from fragmentary inscriptions relating to the Vitruvia family, found near Formiæ, the present *Mola di Gaeta*, that Vitruvius was born in that neighborhood. As he speaks of a temple erected in honor of Augustus, in his basilica at Fano, the likelihood is, that his work was composed late in life, and presented to Octavius after he had assumed the title of emperor. Pollio was undoubtedly well born, highly cultivated, and endowed with unusual talents. In the introductory to his sixth book he says: "Such as possess the gifts of fortune are easily deprived of them; but when learning is once fixed in the mind, no age removes it, nor is its stability affected during the whole course of life. I therefore feel myself under infinite obligations, and am grateful to my parents, who, adopting the practice of the Athenians, took care, that I should be taught an art, and one of such a nature, that it cannot be practiced without learning and

"a general knowledge of the sciences.
 "Since, then, by my parents' care, and
 "by the instructions of masters, I had
 "the means afforded me of acquiring
 "knowledge, and was naturally delighted
 "with literary and philosophical sub-
 "jects, I laid up those stores in my
 "mind, from the use of which I enjoy
 "the advantage of wanting no more;
 "and the value of riches consists in
 "having nothing to wish for. But some,
 "thinking perhaps lightly of these
 "things, suppose those only are wise,
 "who have plenty of money. Hence
 "many, aiming at that end alone, have,
 "by the aid of their assurance, acquired
 "notoriety from their riches. But I,
 "Cæsar, have not sought to amass
 "wealth by the practice of my art,
 "having been rather contented with a
 "small fortune and reputation, than
 "desirous of abundance accompanied
 "by a want of reputation. It is true,
 "that I have acquired but little; yet I
 "still hope, by this publication, to be-
 "come known to posterity. Neither is it
 "wonderful, that I am known but to a
 "few. Other architects canvass and go
 "about soliciting employment, but my
 "preceptors instilled into me a sense of
 "the propriety of being requested, and
 "not of requesting, to be entrusted, in-
 "asmuch as the ingenuous man will
 "blush and feel shame in asking a
 "favor; for the givers of a favor, and
 "not the receivers, are courted. What
 "must he suspect, the trust of the ex-
 "penditure of whose money is person-
 "ally solicited by another, but that it is
 "for the sake of gain and emolument?
 "Hence the ancients entrusted their
 "work to those architects only, who
 "were of good family, and well brought
 "up; thinking it better to trust the
 "modest than the bold and arrogant
 "man.

"These artists only instructed their
 "own children, or relations, having
 "regard to their integrity, so that
 "property might be safely committed
 "to their charge. When, therefore,

"I see this noble science in the hands
 "of the unlearned and unskilful, of
 "men not only ignorant of architec-
 "ture, but of every thing relative
 "to buildings, I cannot blame pro-
 "prietors who, relying on their own in-
 "telligence, are their own architects;
 "since, if the business is to be conducted
 "by the unskilful, there is at least more
 "satisfaction in laying out money at
 "one's own pleasure, rather than at that
 "of another person. No one thinks of
 "practicing at home any art (as that of
 "a shoemaker, or fuller, for instance, or
 "others yet easier), except that of an
 "architect, and that, because many, who
 "profess the art, are not really skilled in
 "it, but are falsely called architects."

From the introduction to his second
 book we gather, that Vitruvius was
 small in person, and lived to some age.
 "But to me, Emperor, nature hath
 "denied an ample stature; my face is
 "wrinkled with age, and sickness has
 "impaired my constitution. Deprived
 "of these natural traits, I hope, how-
 "ever, to gain some commendation
 "through the aid of my scientific
 "acquirements, and the precepts I shall
 "deliver."

In the Roman military service, Vitru-
 vius must have held a position corre-
 sponding to the rank of higher officer in
 the United States Topographical Engi-
 neers, as, if otherwise, we must construe
 his remark to signify ordnance-sergeant,
 which, from facts previously adduced,
 would be most unlikely. When dedicat-
 ing his Architecture to the Emperor
 Augustus, he declares: "My reverence
 "for the memory of your virtuous father,*
 "to whom I was well known, and from
 "whom, now a participator in council
 "with the gods, the empire descended
 "to you, has been the cause of your
 "good will towards me. Hence, together
 "with M. Aurelius, P. Numisius and
 "Cn. Cornelius, I have been appointed
 "to, and received the emoluments arising

* This must be meant for Julius Cæsar, whose grand-
 nephew and adopted son and heir Octavius was.

"from, the care of the various engines of war, which you assigned to me, on the recommendation of your sister. As, through your kindness, I have thus been placed beyond the reach of poverty, I think it right to address this treatise to you; and I feel the more induced to do so, from your having built, and being still engaged in the erection of, many edifices."

We thus find that the straightforward integrity of Vitruvius was rewarded with a permanent office of respectable emolument and high trust under the empire.

If, in a pecuniary point of view, he cannot be considered successful in the world; and, if, as is too evident from his own writings, that—a thing not unusual with men of mark in later days, even the present—he met with opposition from his professional brethren, men of fewer acquirements, more pliancy and greater patronage; manifestly it was owing to an irrepressible frankness of mind. Joseph had innocently told his dream, concerning his sheaf having arisen and stood upright; and, behold, all his brothers' sheaves had stood round about and made obeisance to his sheaf; and Joseph was instantaneously hustled out of good society into—the rulership of a vast kingdom. Vitruvius had, indeed, the most utter contempt for sciolism, and the plainest possible way of showing it. For instance, he had the wretched impolicy to write: "In the magnificent and spacious Grecian city of Ephesus, an ancient law was made by the ancestors of the inhabitants, hard, indeed, in its nature, but nevertheless equitable. When an architect was entrusted with the execution of a public work, an estimate thereof being lodged in the hands of a magistrate, his property was held as security until the work was finished. If, when finished, the expense did not exceed the estimate, he was complimented with decrees and honors. So when the excess did not amount to

"more than a fourth part of the original estimate, it was defrayed by the public, and no punishment was inflicted. But when the excess of cost was more than one-fourth of the estimate, he was required to pay it out of his own pocket. Would to God that such a law existed among the Roman people, not only in respect of their public, but also of their private buildings, for then the unskilful could not commit their depredations with impunity, and those who were the most skilful, in the intricacies of the art, would follow the profession. Proprietors would not be led into an extravagant expenditure, so as to cause ruin. Architects themselves, from the dread of punishment, would be more careful in their calculations, and the proprietor would complete his building for that sum, or a little more, which he could afford to expend. Those who can conveniently expend a given sum on any work, with the pleasing expectation of seeing it completed, would cheerfully add one-fourth more; but when they find themselves burdened with the addition of half, or even more than half, of the expense originally contemplated, losing their spirits and sacrificing what has already been laid out, they incline to desist from its completion. Nor is this an evil, which occurs in buildings alone, but also in the shows of gladiators in the Forum, and in the scenes of plays exhibited by the magistrates,* in which neither delay nor hindrance is admitted, since there is a necessity for their being completed by a certain time."

From the above, and other similar outcroppings, it will be shrewdly suspected, that the one, and probably the only, point Vitruvius failed in, was want of tact: tact, that ready and most comprehensive word, expressing so delicately the exquisite mental manipulation of the

* Modern municipal displays of fire-works, receptions of distinguished individuals, erection of political wigwags, and so forth.—*Ed.*

born manager of men, which persuades every tactile man, within its influence, to feel, that the arch-tactician is so genial, so obliging, so prone to seek occasion for conferring a favor, and altogether so much a man of men. Tact, the want of which is so seldom countervailed, that only the ever-and-everywhere-en-croaching preponderant power of the born ruler of men can possibly do without it, and which it were much better even for such to possess and employ. Here was Vitruvius,—well born, highly gifted, and thoroughly cultured; and successful in his art, though not in its reward; attending to his own affairs, and assuredly taking pains to be just to all men; a good son and a good neighbor; who was very unpopular, and comparatively poor. Singularly enough, the only architect, whom we can legitimately call his successor, considering and comparing the very peculiar and increasing influence belonging to both, as discoverers and effectual transmitters of fundamental principles, Andrea Palladio, the Vicentine,—who, born in poverty, of the humblest parentage, yet by his assiduity in all the liberal studies, his successful researches into the true principles of ancient architectural art, his exceedingly happy application of those principles in the adornment of Vicenza, and—what the over-hasty biographers forgot to mention—his consummate tact, was made free of his native city, and cheerfully received into the body of the nobility. We lighten this melancholy comparison with the side remark, that, by an exceedingly curious coincidence, the family names of these architectural worthies—*Pollio*, *Palladio*—both begin and end with the same letters. All honor to these two glorious sons of Italy, who lived inside a circle of two hundred and seventy miles, in the same land, indeed, but nearly sixteen hundred years apart.

Vitruvius may have been shy and reserved, but he was neither a misanthrope, nor a disappointed malignant. Through-

out his work he is thoroughly genial; and nothing seems to afford him more satisfaction than to praise others, when deserving. What, pray, is the value of indiscriminate praise?

In the second chapter of his sixth book, *Pollio* acknowledges the superiority of genius to learning. He was one of the writers from whom *Pliny* compiled; and he is mentioned by *Frontinus*, in his *Treatise on Aqueducts*, as the first who introduced the *Quinarian* measure. His influence over after ages is best hinted, in a few words, by his best English translator, *Joseph Gwilt*, who speaks of “the singular connection “between the successful cultivation of “the arts and the appearance of the “different editions of *Vitruvius*.” His practice comprised what, in our day, is equivalent to the three closely allied professions of architecture, and civil and military engineering; although, in modern times, it generally requires two professors for the three professions, surveying being certainly comprehended in the last two and generally in the first. Thus, there are many, who successfully combine architecture and civil engineering, or military and civil engineering, or even general engineering with naval construction, but few practice the entire corresponding range now, as *Vitruvius* did then. At the same time, to obtain a fair comparison, it must be recollected, that the same range embodies many times the ancient amount of detail.

We refer constantly to the ancients. *Vitruvius* very frequently does the same. Let us see, then, what this ancient-modern, or modern-ancient has to advance.

THE CHARACTER OF AN ARCHITECT.

When he says, that an architect should be a good writer, he only means what is now a good penman; and good merely in the qualities of facility and legibility, that he may make rapid and reliable minutes of the points derived from read-

ing, or observation. Elegant penmanship might be demanded of, but can hardly ever be obtained from, proficient first-class draftsmen. It has almost become an axiom, of late, that a first-class draftsman is a poor penman, and that those who write the most elegant, free hand cannot draw well. This may, at first blush, seem very strange, but really is very natural. The two things require entirely different gifts, which *may* belong to the same individual, but hardly ever *do*. It is an almost invariable rule, that the natural penman is of a careless, easy, off-hand disposition, the natural draftsman is careful, observing and exact. The one is only interested in the harmony of dashing, graceful curves, or of straight lines, with themselves. Their exact position upon the page, sometimes even their size is a matter of little moment; but a broken-backed curve, or a wavering straight line, is an aggravating defect. The other, whether working on objects of art or of nature, with straight or with curved lines, must draw the exact outlines of his subject, precisely as they appear, not only with regard to the subject itself, but to all surrounding objects. No allowance, whatever, is, or can be, made him. He always depicts the set lines of a set subject in a set space, or he utterly fails to carry out his intention. Such a man may print, may text, may write a slow, set hand, or may illuminate magnificently; but the very deftness and delicacy of fingers, which compass all these, prevent him from being a good, rapid, commercial penman generally. On the other hand, while the successful free-hand penman may attempt to draw, he only jerks—and dashes—and erases—and never, by any chance, gets a particular line where he wants it. If very proficient and dexterous, his nearest approach to drawing is the chirographically fine, but pictorially inartistic approximation of particular forms, such as pens, plumes, birds, and so forth, by set flourishing,

or, technically, *striking*. He may also draw geometrically tolerably well, but not fast; and he will never become really skilled in free-hand drawing, or higher art.

Our present exemplar, Pollio's distinction between the relative values of theory and practice, and his insistence, that the architect should be a skilful draftsman, versed in geometry, the concrete and the abstract mathematics, and the entire range of natural philosophy, are as pertinent to the nineteenth century of the Christian era, as to the last of the heathen. That the architect should be thoroughly versed in the history of architecture, no one will dispute; but why he must be acquainted with general history is not so obvious. However, as our quotations will presently show, Vitruvius makes out his case. We will extend him here, a little, by maintaining, that the architect ought to be well grounded in the biography of distinguished members of the craft. Perchance, though, he mentally included this in history. Ethics would seem to be an extraneous branch of the *professional* education: and only to belong to the architect, in common with every good citizen of the community. Pollio's reflections thereon are just, so far as they extend; but, to be fully just, should embrace all human beings.

His chief reasons why the architect should be a musician are not so cogent to modern, as they were, possibly, to ancient ears; yet, as acoustic failures are the rule, and acoustic successes the exception, in public buildings now, haply, all architects might ponder with profit, the remarks of Vitruvius, at the end of chapter 3, book 5, upon the Greek vessels answering as sound-reflectors, viz.:

"The ancient architects, following
"nature as their guide, and reflecting
"upon the properties of the voice, regulated the true ascent of steps in a theatre, and contrived by musical proportions and mathematical rules, *whatever*
"its effect might be upon the stage, (scena,)

"to make it *fall on the ears of the audience* in a clear and agreeable manner. Since in brazen or horn wind instruments, by a regulation of the genus, their tones are rendered as clear as those of stringed instruments, so by the application of the laws of harmony, the ancients discovered a method of increasing the power of the voice in a theatre." His reference here is to all public interiors arranged on a circular or semi-circular plan, whose section would be the longitudinal one of an obtuse cone inverted, the speaker's position being at the lowest point and the seats gradually rising one above another, as in medical lecture-rooms, or some round churches. This is but partly applicable to the auditorium of a theatre or opera house at present, still the hint might be useful.

Law, so far as relates to contracts, to business and domestic life in connection with party walls, "ancient windows," the right of way, and the "rights of things," the competent professional man should certainly know. But as architects, now-a-days, are not held to manufacture the clocks put up in their own towers, we do not see how "astronomy" can greatly assist him; and the other points under this head are not germane, owing to the modern division of labor. Vitruvius in referring to grammar must be considered to have also included rhetoric. These too are equally common and equally desirable to all cultured men. The best ideas in the universe avail a man little, without idiomatic diction, and purity and beauty of expression, but with these, the inattentive or unwilling world is first, induced to listen; directly, obliged to weigh; and at last, constrained to applaud.

Vitruvius, inferentially, makes the science of medicine one of the branches not unprofitable for an architect; but does not enlarge upon it, unless we are to consider his 4th chapter, "On the Choice of Healthy Situations," as an enlargement. Yet as the medical knowl-

edge of an architect cannot change the endemic influences of any region, we do not see, that this accomplishment would have any scope, beyond securing the water-proofing, ventilation and drainage of any supposed pile or block.

When, however, Vitruvius controverts the position of Pythius, "*one of the ancients*," that "an architect should have that knowledge of each art and science, which is not even acquired by the professors of any one in particular, who have had every opportunity of improving themselves in it"—we feel, that he was a man of circumspection, as well as penetration; and that we can implicitly trust him in any thing he adduces, of his own knowledge, concerning architecture, either in its theoretical, or in its practical aspect—whether as a science, or as an art.

ARCHITECTURE

AND

THE EDUCATION OF AN ARCHITECT.

Architecture is a science arising out of many other sciences, and adorned with much and varied learning, by the help of which a judgment is formed of those works which are the result of other arts. Practice and theory are its parents.

Practice is the frequent and continued contemplation of the mode of executing any given work, or of the mere operation of the hands, for the conversion of the material in the best and readiest way.

Theory is the result of that reasoning which demonstrates and explains that the material wrought has been so converted as to answer the end proposed.

Wherefore, the mere practical architect is not able to assign sufficient reasons for the forms he adopts, and the theoretic architect also fails; grasping the shadow instead of the substance.

He who is theoretic, as well as practical, is therefore doubly armed; able not only to prove the propriety of his design, but equally so to carry it into execution.

In architecture, as in other arts, two

considerations must be constantly kept in view, namely, the intention, and the matter used to express that intention; but the intention is founded on a conviction, that the matter wrought will fully suit the purpose. He, therefore, who is not familiar with both branches of the art, has no pretension to the title of an architect.

An architect should be ingenious and apt in the acquisition of knowledge. Deficient in either of these, he cannot be a perfect master. He should be a good writer, a skilful draftsman, versed in geometry and optics, expert at figures, acquainted with history, informed on the principles of natural and moral philosophy, somewhat of a musician, not ignorant of the sciences, both of law and physic, nor of the motions, laws and relation to each other of the heavenly bodies. By means of the first-named acquirement, he is to commit to writing his observations and experience in order to assist his memory. Drawing is employed to represent the forms of his designs. Geometry affords much aid to the architect; to it he owes the use of the right line and circle, the level and the square, whereby his delineations of buildings on plane surfaces are greatly facilitated. The science of optics enables him to introduce, with judgment, the requisite quantity of light, according to the aspect. Arithmetic estimates the cost, and aids in the measurement of the work; this, assisted by the laws of geometry, determines those abstruse questions, wherein the different proportions of some parts to others are involved. Unless acquainted with history, he will be unable to account for the use of many ornaments, which he may have occasion to introduce. For instance, should any one wish for information on

THE ORIGIN OF CARYATIDES,

Those draped matronal figures, crowned with a mutulus and cornice, he will explain it by the following history :

Carya, a city of Peloponnesus, joined the Persians in their war against the Greeks. These, in return for the treachery, after having freed themselves, by a most glorious victory, from the intended Persian yoke, unanimously resolved to levy war against the Caryans. Carya was, in consequence, taken and destroyed, its male population extinguished, and its *matrons carried into slavery*. That these circumstances might be better remembered, and the nature of the triumph perpetuated, the victors represented them *draped, and apparently suffering under the burthen with which they were loaded, to expiate the crime of their native city*. Thus, in their edifices, did the ancient architects, by the use of these statues, hand down to posterity a memorial of the crime of the Caryans.

ORIGIN OF ATLANTES.*

Again : A small number of Lacedæmonians, under the command of Pausanias, the son of Cleombrotus, overthrew the prodigious army of the Persians at the battle of Platea. After a triumphal exhibition of the spoil and booty, the proceeds of the valor and devotion of the victors were applied by the government to the erection of the *Persian portico* ; and, as an appropriate monument of the victory, and a trophy for the admiration of posterity, *its roof was supported by statues of the barbarians in their magnificent costume* ; indicating, at the same time, the merited contempt due to their haughty projects ; intimidating their enemies by fear of their courage ; and acting as a stimulus to their fellow-countrymen, to be always in readiness for the defence of the nation. This is the origin of the *Persian order for the support of an entablature* ; an invention which has enriched many a design with the singular variety it exhibits.

* Also called *Atlantides* and sometimes *Telamones*.
—Ed.

Many other matters of history have a connection with architecture, and prove the necessity of its professors being well versed in it.

Moral philosophy will teach the architect to be above meanness in his dealings, and to avoid arrogance. It will make him just, compliant and faithful to his employer; and, what is of the highest importance, it will prevent avarice gaining an ascendancy over him. For he should not be occupied with the thought of filling his coffers, nor with the desire of grasping every thing in the shape of gain; but, by the gravity of his manners, and a good character, should be careful to preserve his dignity. In these respects, we see the importance of moral philosophy, for such are her precepts.

That branch of philosophy, which the Greeks called *φυσιολογία* [physiologia] or the doctrine of physics, is necessary to him in the solution of various problems; as, for instance, in the conduct [conduction, or conveyance] of water, whose natural force, in its meandering and expansion over flat countries, is often such as to require restraints, which none know how to apply but those who are acquainted with the laws of nature; nor, indeed, unless grounded in the first principles of physics, can he study, with profit, the works of Ctesibius, Archimedes, and many other authors, who have written on the subject.

Music assists him in the use of harmonic and mathematical proportions. It is, moreover, absolutely necessary in adjusting the force of the balistæ, catapultæ and scorpions, in whose frames are holes for the passage of the homotona, which are strained by gut-ropes, attached to windlasses worked by hand-spikes. Unless these ropes are equally extended, which only a nice ear can discover, by their sound, when struck, the bent arms of the engine do not give an equal impetus, when disengaged; and the strings, therefore, not being in equal states of tension, prevent

the direct flight of the weapon [missile]. So the vessels called *ἡχεῖα* [hecheia] by the Greeks, which placed in certain recesses, under the seats of the theatres, are fixed and arranged with a due regard to the laws of harmony and physics, their tones being fourths, fifths and octaves; so that, when the voice of the actor is in unison with the pitch of these instruments, its power is increased and mellowed by impinging thereon. He would, moreover, be at a loss in constructing hydraulic and other engines, if ignorant of music.

Skill in physic enables him to ascertain the salubrity of different tracts of country, and to determine the variation of climates, which the Greeks call *κλίματα* (klimata); for the air and the water of different situations, being matters of the highest importance, no building will be healthy without attention to these points.

Law should be an object of his study, especially those parts of it which relate to party-walls, to the free course and discharge of the eaves' waters, the regulations of cess-pools and sewerage, and those relating to window lights. The laws of sewerage require his particular attention, that he may prevent his employers being involved in lawsuits, when the building is finished. Contracts, also, for the execution of the works, should be drawn with care and precision, because, when without legal flaws, neither party will be able to take advantage of the other.

Astronomy instructs him in the points of the heavens, the laws of the celestial bodies, the equinoxes, solstices, and courses of the stars; all of which should be well understood, in the construction and proportions of clocks.

Since, therefore, this art is founded upon and adorned with so many different sciences, I am of opinion, that those who have not, from their early youth, gradually climbed up to the summit, cannot, without presumption, call themselves masters of it.

Perhaps, to the uninformed, it may appear unaccountable, that a man should be able to retain in his memory such a variety of learning; but the close alliance with each other of the different branches of science will explain the difficulty. For, as a body is composed of various concordant members, so does the whole circle of learning consist in one harmonious system. Wherefore, those, who, from an early age, are initiated in the different branches of learning, have a facility in acquiring some knowledge of all, from their common connection with each other.

On this account, Pythius, one of the ancients, architect of the noble temple of Minerva, at Priene, says, in his commentaries, that an architect should have that perfect knowledge of each art and science which is not even acquired by the professors of any one in particular, who have had every opportunity of improving themselves in it.

This, however, cannot be necessary; for how can it be expected that an architect should equal Aristarchus as a grammarian, yet should he not be ignorant of grammar. In music, though it be evident he need not equal Aristoxenus, yet he should know something of it. Though he need not excel as Apelles in painting, nor as Myron or Polycletus in sculpture, yet he should have attained some proficiency in these arts. So in the science of medicine, it is not required that he should equal Hippocrates. Thus also, in other sciences, it is not important, that pre-eminence in each be gained; but he must not, however, be ignorant of the general principles of each. For, in such a variety of matters, it cannot be supposed that the same person can arrive at excellence, in each, since to be aware of their several niceties and bearings cannot fall within his power. We see how few of those, who profess a particular art, arrive at perfection in it, so as to distinguish themselves: hence, if but few of those practising an individual art obtain lasting

fame, how should the architect, who is required to have a knowledge of so many, be deficient in none of them, and even excel those who have professed any one exclusively. Wherefore, Pythius seems to have been in error, forgetting that art consists in practice and theory.

Theory is common to, and may be known by all, but the result of practice occurs to the artist in his own art only. The physician and musician are each obliged to have some regard to the beating of the pulse, and the motion of the feet; but who would apply to the latter to heal a wound or cure a malady? So, without the aid of the former, the musician affects the ears of his audience, by modulations upon his instrument. The astronomer and musician delight in similar proportions, for the positions of the stars, which are quartile and trine, answer to a fourth and fifth in harmony. The same analogy holds in that branch of geometry which the Greeks call *λόγος ὀπτικός* (*logos optikos*): indeed, throughout the whole range of art, there are many incidents common to all. Practice, alone, can lead to excellence in any one. That architect, therefore, is sufficiently educated, whose general knowledge enables him to give his opinion on any branch, when required to do so.

Those to whom nature has been so bountiful, that they are, at once, geometicians, astronomers, musicians, and skilled in many other arts, go beyond what is required of the architect, and may properly be called mathematicians, in the extended sense of that word. Men so gifted discriminate acutely, and are rarely met with. Such, however, was Aristarchus of Samos, Philolaus and Archytus of Tarentum, Apollonius of Perga, Eratosthenes of Cyrene, Archimedes and Scopinas of Syracuse: each of whom wrote on all the sciences. Since, therefore, few men are thus gifted; and yet it is required of the architect to be generally well informed; and, it is manifest, he cannot hope to excel in

each art, I beseech you, O Cæsar, and those who read my works, to pardon and overlook grammatical errors, for I write neither as an accomplished philosopher, an eloquent rhetorician, nor an expert grammarian, but as an architect.

So far Vitruvius himself, who, manifestly, had taken full time and pains to learn, in order the more acceptably to teach. There are many good passes to the temple of knowledge; but there is no short, there is no easy, there is no royal road. Though a lofty, it is yet an attainable height, with many lower yet elevated plateaux for occasional rests, or excursions, with, it may be, warning precipices for the selfish, or the insincere seeker—but it cannot be climbed by proxy. The difficulties may often be lightened by earlier travellers, but every step of the route must be taken by the inquirer in person; every human soul here, must either stay below, or get up by, in and for itself; happier far thereafter, if, by counsel, enabled to smooth the course of those who follow, with varying effort and success, more or less remotely behind.

Our great lexicographer, Noah Webster, pointing to the library, used to say to his children in effect: "I cannot learn for you; but there are the books wherefrom were derived all my own acquisitions. Search diligently and carefully and you will know." This search, however, implies just the reverse of indiscriminate, omnivorous task-reading. It comprehends selection along with concentration to one range of subjects, if a special branch of knowledge, or a special work is contemplated; or discrimination in variety if we read for general information. So far, success must rest upon our own efforts. Afterwards, much depends upon social position, and the inclination of those around to help us with a pleasant greeting, or a good word. Friends are attracted by the human sympathy, which exhibits to them an interest in themselves or in great human

interests. No special effort, however, is required to show this, for the sincere soul will diffuse its sincerity through the eyes and the voice. The remainder must be left to Providence, not blindly and indolently, but with the constant exercise of the clearest intent, and the most persevering energy. No man of himself can force a brilliant destiny.

"Men are the sport of circumstances, when
The circumstances seem the sport of men."

With all this, a high position cannot be reached with a low aim. In Goethe's few lines of counsel from experienced manhood to inexperienced youth, derived "from the Coptic" of his own brain, are these teeming words:

"Thou must either serve, or govern:
Must be subject or be sovereign;
Must, in fine, be block or wedge;
Must be anvil, or be sledge."

But, as we gather up these sheets for the printer, the question recurs, "Was Vitruvius unsuccessful?" or, to put it in another form, "Did he fail to attain the grand object of his life?" Whatever reply may come from the general world—perhaps the least trifle in nature, too much preoccupied when listening, or when reading, and yet a scintilla more hasty in judging, than preoccupied in attending—we say, that, He did not fail! What are his own words, quoted near the beginning of this article? They are these: "YET I STILL HOPE, BY THIS PUBLICATION, TO BECOME KNOWN TO POSTERITY." Bold words, springing from the irrepressible sense of innate merit, whether courted or neglected. But quite a number of times throughout the historic generations, bolder words have been put forth by men of great minds, and have been literally confirmed. It is true, that the lot of these was often adversely cast, even to the very end. Yet, at the moment we cannot recall, and neither do we believe we could, upon mature reflection, any instance wherein the hope was expressed, or the prophecy was made, that posterity did

not amply fulfil it. Dante, Milton, and Byron, are notable examples; but their envious contemporaries flayingly discounted the reversion. The giant would have such a happy time, of he could only get down among the dwarfs; but how difficult is this for him to do. Sometimes he tries it, but unluckily some dwarf or other discovers his stature, and tells it among his fellows, after which, the dwarfs are somehow uncomfortable with the giant, and the giant is rendered very uncomfortable amongst the dwarfs. Occasionally a very good-natured, excessively healthy and, therefore, genial giant does succeed, and does little things of routine, custom, or courtesy, so nearly in the manner of the dwarfs; and manages to effect his great purposes so very unobtrusively, that some day he dies, and, lo! the disconsolate dwarfs can hardly find for him a coffin large enough. How grateful, how gracious, how lovely a thing is appreciation, yet if the yearning lover of his kind cannot have it in his lifetime, let him work on faithfully and cheerfully, doing what good he may,

and deferring the result to God. When we remember how many useful, how many beautiful, things could only have come down to us, from the long past ages, through this self-devoted hope, yet how many more, of equal value, have failed to breast the raging flood of time, we yield not an iota of the renown of VITRUVIUS, who has preserved for us so much of the knowledge of the past. Had he rested in his warm admiration of the older authors, pampering himself with the assumption "that knowledge is power," instead of wisely feeling that knowledge is only the magazine of power—power itself arising from action alone—we should have lost all; had he been fond of mere passing pleasure or selfish ease, we should have suffered; had Vitruvius bowed his will to the search for riches, Palladio never could have praised or passed him. But he thought mainly of the diffusion of the benefits arising from knowledge, skill and experience, among men the author never could behold. He loved posterity, and posterity loves him.

THE ROAD TO RED RIVER.—Mr. Dawson, the engineer employed by the New Dominion government to survey the route from Lake Superior to the Red river, has made his report. He recommends that the line should be opened in the cheapest and most expeditious manner at once. The total distance from Thunder Bay on Lake Superior to Fort Garry is 463 miles, comprising 332 miles of navigable water and 131 miles of land travel. Ninety miles of the latter would be between Fort Garry and the Lake of the Woods, where there is abundant means of transport, and 25 miles between Thunder Bay and Dog Lake, where horses and wagons could be easily provided. The principal part of the land carriage would therefore be at each end, with water carriage intermediate. The cost of opening communication with Fort Garry in this manner set down at \$166,000 over and above

the small appropriation made last year. The total trade of the Red river and Hudson's Bay territory is estimated at \$4,000,000 annually; most of which is now done with the State of Minnesota.

AN inspection of the remains of Stephen A. Douglas was made preparatory to their removal to the tomb erected to his memory. Upon removing the lid covering the glass, the face of the illustrious Senator was found to be in a remarkable state of preservation, almost as natural as when buried seven years ago. The complexion is very fair, the contour of the head and face apparently unchanged, and the expression quite natural and plainly recognizable. The hair looks as black and glossy as ever, and the raiment as new and tidy as when first put on, not presenting the first evidence of mildew or discoloration.

THE PENN TREATY-GROUND

AND

A MONUMENT TO WILLIAM PENN.

[Concluded from No. 1, page 32.*]

OLD PROPOSED LOCALITIES FOR PHILADELPHIA.

THERE was a survey made, in 1682, for starting a city of Philadelphia at the mouth of Poetquessing creek, where is now [1835] G. W. Morgan's seat; and many persons had gone into and made settlements in Byberry, both places within the bounds of King Tamamen's lands.—WATSON.

Samuel Preston, of Stockport, Wayne county, formerly of Bucks county, Pa., saw in the Surveyor General's office of Bucks county, Pa., an original draft of the city, of older date than that by Holmes, and signed Phineas Pemberton. This was to be located upon the great bend of the Delaware, opposite Burlington, N. J., on the Pennsbury manor tract.—BARKER. DU PONCEAU.

The charter from Charles II. to William Penn, conveying proprietary rights for the Province of Pennsylvania and the "three lower counties on the Delaware," is dated March 4, 1681. Penn's conditions to his purchasers of land in the new colony, called "concessions" in the document itself, are dated July 11, 1681.

Markham, William Penn's cousin, came over to Pennsylvania in the month of May, 1681, to take possession in the name of the new proprietary. There is no tracé of correspondence between agent and principal for seventeen months thereafter. A few letters might make the incipient history of the colony under Penn perfectly luminous. We have not found them, and we never may.

Penn named, as his envoys to the Indians, three Commissioners, William

Crispin, John Bezar, and Nathaniel Allen. Their appointment is dated September 30th, and their letter of instructions, October 18th, 1681. They probably sailed the latter part of the last-named month, in the "Bristol Factor," Roger Drew, Master, which, we are told, arrived at Upland, now Chester, Pa.; and the river having frozen the night they went ashore, they remained there all winter.

Penn arrived out in his colony, October 24th, 1682. He treated with the Indians within a few weeks, but bought no land of them.—DU PONCEAU. FISHER.

EXACT DATE OF TREATY, UNKNOWN.

The exact date of the Treaty is now, and likely ever will remain, unfixed. It was certainly held late in 1682. It is not determinable to a week, much less to a day. After an exhaustive inquiry, and from a very strong array of circumstances, Du Ponceau and Fisher place it towards the end of November, 1682–3, the double year arising from the old style calendar. It belonged, then, very exactly to our present Thanksgiving season, in the immediate neighborhood of one-month before Christmas, a circumstance tending greatly to enhance the value of that already genial festival to Pennsylvanians, making the almost invariable Thursday, of variable date, a double holiday and a double Thanksgiving. It was in the peaceful, dreamy days of Indian summer, symbolizing

* The writer would willingly have confined this article to his own reflections and recommendations, but in that case it must have been obscure to all not possessing the authorities herein quoted, not at full but synoptically; although due credit has been given wherever possible; and all the writers or speakers drawn upon are designated somewhere in the essay. He hopes that, though the matter could not, from the character of this publication, be worked up in extenso, all the essentials are, at least, clearly indicated. He would have been glad to compress the historical portion into a single page; but this is emphatically one of "those things, which cannot be set locket-fashion."

the quiet decadence of this once and again warlike tribe, as well as the contemplative ease and quiet of the infant white community—the one never again, save for a momentary sprouting, instantly frost-killed, to see ensuing spring—the other replete with burgeons and buds yet yielding perennial leafage, flowers and fruit. As a high solemnity, the likelihood is, that it comprised three consecutive days: the informal conference, with friendly conversation; the formal discussion, involving Christian persuasion and lofty Indian oratory; and the sacred convention, typified by the interchange of engrossed vellum and symbolic wampum.

ABORIGINAL TOPOGRAPHY.

King Tamanen and Matamequan,* on the 23d of fourth month, 1683, [equivalent to February 23d, 1683, now,] sell to William Penn lands from Neshamenek creek to Pemapecka, [now Pennypack creek.]—WATSON.

Watson is right in wishing to have located and surveyed, for public use, the two ancient Indian trails sketched on the diagram accompanying Governor Thomas Holmes' requisition to survey the land bought for William Penn, July 30th, 1685, of Shakkoppoh, Secane, and other Sachems. The ground-plot of the survey goes in a direct line from Philadelphia to a spot upon the Susquehanna, at about three miles above the "Conestogan," near to a spot marked "Fort demolished." The line crosses two Indian paths, running each northwest by north; the first at fifteen miles from Philadelphia, at "Rocky Run," the other at thirty-eight miles distant, near a rivulet, "two miles beyond Doe Run." They are probably the line of original incursion of the Lenni Lenape on their aggressive march, from the far northwest, against the Allegewi, the Watling street and Irming street of savage North America.

* Tamanen means, *The affable*, and Matamequan, *The enterer* [into a house].

DIPLOMACY—WHITE AND RED.

Granville John Penn remarks: "It would appear that the great Treaty of 1682 was conducted, throughout, with the usual circumstances of diplomatic action on both sides. First, there were the preliminary negotiations through his Commissioners, prior to the arrival of William Penn in this country, by whose hands he sends a letter, in which he says: 'I desire to enjoy it, [my Province,] with your love and consent.' I shall shortly come to you myself, at which time we may more largely and freely confer and discourse of these matters; in the mean time I have sent my Commissioners to treat with you about land, and a firm league of peace. Let me desire you to be kind to them and the people, and receive these presents and tokens, which I have sent you, as a testimony of my good will, and my resolution to live justly, peaceably, and friendly with you." This was in 1681.

Ebeling relates: "William Penn found means to acquire the favor of the Indians, not only by solemn conferences and treaties, but by friendly visits and conversations in their own language, assisting at their festivals, making presents, and so forth."

PENN'S INDIAN OUTLAY AND INDIAN ACQUIREMENTS.

Mr. Oldmixon observes: "This friendship and civility of the Pennsylvania Indians are attributed to Mr. Penn the Proprietary's extreme humanity and bounty to them, he having laid out some thousands of pounds to support and oblige them." This would not be less than £4,000, equivalent to £20,000, now-a-days, or, with average exchange against us, about \$106,000, gold, in presents. We require no very elaborate computation to show that a pound then was equivalent to five pounds now. The yearly incomes of the heroines of the

novels of that day, compared with those of this, will show the calculation to be far within bounds Yet it is customary to talk of his having bought the entire State for a paltry sum, lessened by the profits on the goods delivered in payment, of which a great part were gew-gaws.

In 1683, the year after his arrival, Penn had made himself master of the Delaware language, so as not to need an interpreter. This shows a familiar and frequent intercourse with the tribes.

Mr. Oldmixon, the historian, who personally knew William Penn, and in all likelihood had his information direct, remarks: "Mr. Penn stayed in Pennsylvania two years, and having made a league of amity with nineteen (19) Indian nations,* * * * returned to England."

Of the results of the Treaty, Mr. Oldmixon says: "The Indians have been very civil to the English, who never lost man, woman or child by them."

These last six paragraphs all refer, allegorically, to *the place of the eels.*

THE TREATY.

NOT FOR LAND.

Popular estimation of the Treaty refers it to the purchase of land. It is shown, however, with scarcely a doubt, by Watson, Vaux, Du Ponceau, Fisher, Granville John Penn, and Henry D. Gilpin, to have been "a great meeting of verbal conference and pledge," the last of a series held at the same point, at no great intervals of time, wherein mutual courtesies were exchanged, and reciprocal solemn promises of lasting friendship pronounced. Or, in the phrase of Du Ponceau and Fisher, it was an "important transaction, which to Pennsylvania and her illustrious Founder, is a crown of glory that will last to the end of time."

* This means *Tribes.*

PHILADELPHIA

FOUNDED IN AN OLD WHITE SETTLEMENT.

The site, or great part of the site of the city of Philadelphia now, from consolidation, a division of the past, but still known to citizens as the "city proper," was bought by William Penn, in exchange for other lands, of the three brothers, Andries, Swen, and Wolle Swenson, [now Swanson, from which family we have Swanson street.] The tract was three hundred acres. Acrelius says three hundred and sixty, which may be true, including the usual allowance for roads. &c. It covered one mile on the Delaware, extending half a mile westward. The ground on which the Liberties now stand was also the property of the Swedes. The site of Philadelphia itself was called by the Delawares *Coaquannock*, or *Co-a-que-na-que*. The river, its shores and contiguous lands, for some miles above, and a number below the confluence of the Delaware and the Schuylkill, were termed the *freshes of the river Delaware*, inhabited by the Swedes as high up as Wicacoa, within half a mile of Philadelphia. The Delaware itself was styled by the natives, *Lenape-wihittuck*, or *Lenape-Hittuck*; the rapid river of the *Lenape*. *Arasapha* was another Indian name it bore. The Schuylkill was originally the *Manayunk*.* It is a pleasant pleonasm to add the word river to the modern name, which bears in itself Schuyl-kill, the *hidden river*, a Dutch fancy, from the difficulty of detecting its mouth when sailing up the Delaware. The Dutch inhabited the lands upon Delaware Bay, which was entitled by the Indians, *Poutaxat*.

* Which means, "our place of drinking," or "the place where we go to drink."—An unconscious prophecy of the use of the Schuylkill towards the city of Philadelphia. This river was also called *Gan'shówe-ha-né*, or *Ganshowe'han*, the stream which maketh a noise, occasioned by falls and ripples, *Der rauschende Stroh*m. This proper characteristic is all lost now-a-days, through Fairmount and the many other dams. We may notice here that *Wieschickon* means catfish creek; and *Wingo-hocking*, Frankford creek, *fine land for cultivation.*

LAND AS LAND VALUELESS TO THE INDIANS.

Land is not valued by the American Indian, except to rove over. Therefore, if the parties were friendly, the mere occupation, by a white man, of a piece of ground, not in the actual use of an Indian, would be no offence. The Proprietary, then, in perfect good faith, could have sold land to his colonists, upon a guarantee, before buying it of the Indians, as, according to Watson, must have been done in the case of the tract conveyed to the Welsh settlers, on the *western* side of the Schuylkill, as early as 1682-3, when the purchase from Shakkopoh and the other Sachems was not made till 1685. But William Penn was not the kind of man to carry this principle far, and would surely not have built his great city in the face of Indian claimants for the site. There was, it is true, the assumptive ownership of the Five Nations, settled, nearly twenty years afterwards, by the purchase, through Colonel Dongan, of the Iroquois claim to the entire State. The banks of the Delaware were settled, forty years before the period of Penn's Treaty, and intermediately, by the Swedes, the Dutch and the English. Campanius gives account of a treaty held with the savages by Governor Rising in 1654, its heads being much the same with those of Penn's great Treaty. The Quakers at Burlington, N. J., had made a treaty with the natives before the arrival of Penn.

The neck of land formed by the confluence of the Delaware and Schuylkill was most likely, from good reasons, based upon the old records, more thickly inhabited than any part of the province, except, perhaps, the English settlements near the Falls,* opposite Trenton, N. J., and those of the Dutch, in the lower counties. The island of Tinicum, the

seat of the Swedes' government, is at no great distance from Philadelphia. Sven Schute had Swedish royal grants for *Passyunk* and *Kinssessing* [Kingsessing.] The English records of Upland, 1676 to 1681, are full of applications for leave to take up lands, for settlement, on the west side of the Delaware and the east side of the Schuylkill. There are even suits against those *who disturb the possessions of the old settlers*. There is a petition from Lawrence Cock and twenty-three others, for leave to build a town somewhere below the Falls of Schuylkill.

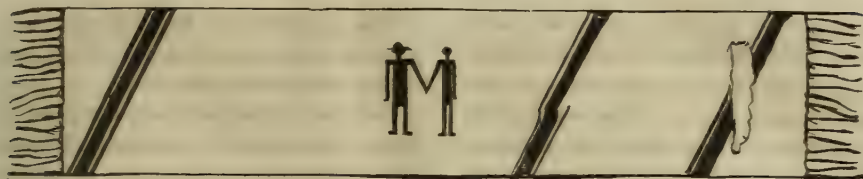
Lasse Andries and three others, of Moyamensing, ask leave to take up each twenty-five acres of marsh or meadow land in their neighborhoods.

The Indian mention of "the little birds warbling on the sprays," at the time of the Great Treaty, proves very definitely, that the spot was near the accustomed habitations of man and not in the virgin forest, where all engaging nature is still as death, the occasional screech of the eagle by day, by night the hoot of the owl, the scream of the cougar, and the howl of the wolf drearily varying the monotony. The smaller inhabitants of the wild, birds, squirrels, and so on, are always quiet, except in the narrow belt of woods immediately beyond the permanent improvements of man.

THE IROQUOIS.

In the time of Penn the valley of the Susquehanna, on the southern border of Pennsylvania, was inhabited by a tribe of Iroquois. This is proved historically by Campanius and Benjamin Franklin, and philologically by Du Ponceau. They were called *Mengwes* by the Delawares, *Maquas* by the Dutch, *Minques* by the Swedes, and *Mingoes* by the English. Mention is made that they were at variance with the Delawares, probably from the dissatisfaction of the latter with the workings of their "womanship"

* As near as now known, the Indian name Makerisk-Kitton, or Makerish-Hitton, was appropriated to the Delaware, about these Falls.



THE WAMPUM BELT OF THE GREAT TREATY.

[On account of the smallness of the scale, the separate beads are not expressed. The figures, however, are reliable.—Ed.]

in the "peace league" accepted from the Iroquois.

Evidently the Five Nations claimed an effectual word in the disposal of the lands and friendship desired by Penn. It crops out in the latter's subsequent purchase of the Pennsylvania lands from them, through Colonel Dongan, as before stated. It appears from the minutes of the Treaty of Governor Gordon with the Iroquois, held at Philadelphia, in 1727, when the Indian speaker, *Tannevhannegah*, said: "The first Governor of this place, *Onas*, when he first came, sent to desire the Five Nations to sell lands to him. They answered, 'We will not sell now: we may in time to come.'"

* * * When the Governor was at Albany he spoke to our head men in effect, 'Well, my brethren, you have conquered these people: we shall buy the lands of you.' This was reported to the Confederacy, whose Council directs us to say: 'We are now ready to sell the lands.'

PENN'S COSTUME.

Penn was very modest with respect to the great Treaty. None of his letters extant mention it, although some embrowned and faded sheet, now lying perdu, may be bristling with the subject. To him, however, as to many great men in their greatest actions, it was a matter, of course, which he could not dream would become famous. We know that he wore, on the occasion, to distinguish him, in Indian eyes, from the other whites, a shoulder-sash of light blue silk, which Clarkson speaks of, as in the possession of Thomas Kett, Esq., of Seething Hall, near Norwich,

Norfolkshire, England. He is traditionally reported as pronouncing, distinctly, the Christian sense of the compact, and then giving a roll of parchment, containing it, to the principal Sachem, *the one who wore the horn in the chaplet*.* He is known to have received, to bind the convention on the Indian side, a broad *Belt of Wampum*, latterly brought over by Granville John Penn, Esq., expressly for presentation to the Historical Society of Pennsylvania, as the representative of the whole people of Pennsylvania.

THE WAMPUM BELT.

Of this, on the formal occasion, Mr. Penn spoke: "I brought out with me 'the *belt of wampum* given to the 'Founder of Pennsylvania by the Indian chiefs, at the Great Treaty, held 'in 1632. That such is the case there 'can be no doubt, though it has come 'down to us without documentary evidence. But the same is the case with 'the *chain and the medal presented by 'Parliament to the Admiral*, father of 'the Founder. Their authenticity depends, for the one, upon the history of 'Pennsylvania, and the universal tradition of both Indians and whites; the 'other upon the journals of the House 'of Commons. Both bear intrinsic 'marks of their genuineness.' * * *

"It [the belt] plainly tells its own

* Catlin speaks of the horn in the head-dress, as distinguishing the principal war-chief, the most influential man of the tribe. The Delawares, as explained elsewhere, could have at that time no war-chief, but still the most active man in public affairs would hold the same rank, a rank superior to that of merely hereditary king or head chief of the tribe, although it might inhere in the same person. Catlin refers this to the Old Testament phrase, "May their horns be exalted," as a possible link between the dispersed "Ten Tribes" and the Indians.

"story. * * Its dimensions are greater than of those used on more ordinary occasions, of which we have one still in our possession." [This smaller belt is probably the voucher of the treaty of 1701.] This second belt is twenty-eight inches long, two and one-half broad, and consists of eight strings of wampum; the ground white, with five figures or diagrams in violet-colored beads worked upon it, three of a diamond-shape, and two of a zig-zag pattern between, at equi-distance from each other.

The belt presented is of the largest size, and made with the neatest workmanship, generally found in such as are known to have been used at councils, or in making treaties with the Indians. Its length is twenty-six inches, its breadth nine inches, and it consists of eighteen strings [of wampum], woven together upon deer sinews. It is formed wholly of small beads, one-quarter of an inch long and one-eighth of an inch wide, and made from pieces of clam or muscle-shells. These give an entirely white ground; in the centre there is a rude but striking representation, worked in dark violet beads, of an Indian, known by his slender frame and bare head, shaking hands with a European, identified from his heavier build and the hat on his head, and both full-length and erect. There are three violet bands, also, one at either end, the other about one-third the distance from each end. These bands may have reference to the number of parties to the treaty, or to the three rivers, Delaware, Schuylkill, and Susquehanna; but the preferable supposition is, that the narrow, broken, and imperfect band at one end is the state and path of the Indian; the broad, perfect, straight band the condition and way of the white man, and the intermediate, partly broad, partly narrow, band, is the conjoined course of both races.

The existence of such a belt as this is proof that a solemn council was held, and matters of great moment decided upon.

The squaws are very dexterous in weaving the symbolic ideas of their lords of the wilderness into belts.

Only strings of wampum are given at the special points of a speech. When a belt of wampum is given, few words are spoken; but they are of the utmost importance, conveying merely the central idea of the council, at the peroration of the opening side, or just before the meeting breaks up. The answer given to a speech, thus accompanied, must be confirmed by strings and belts of wampum, of the same size and number, as those received.

If Sir Walter Scott did not err in almost adoring the regalia of the Scottish kings, surely we may keep and cherish this relic with as sincere and more rational devotion.—CHARLES MENER, of Wilkesbarré.*

And now, after the lapse of more than one hundred and fifty years, [five human generations and seven kingly,] we have the event portrayed in the rude but expressive picture by a native coeval with the transaction.—THOS. P. SERGEANT.*

Here we must indulge ourselves with a quotation from the elegant diction of Hon. Henry D. Gilpin, in response to Granville J. Penn, Esq., the more especially as it embodies, in the "nine links" of the Hon. Patrick Gordon, which we intended to present elsewhere, but have not, all we are ever likely to know of the details of Penn's Treaty. "When, many years after this solemn meeting, the Indians heard of the death of William Penn, they mourned with the deepest grief the loss of their beloved father, protector and friend. Though he had been long absent from the province, they believed that it was his watchful care which had maintained, in good faith, the early pledges of jus-

* Letters on the Wampum Belt.

tice and love. They had heard the war-whoop resounding beyond their borders, in the fierce conflicts between the red man and the white; but, among the mountains and valleys of Pennsylvania, the door of the wigwam had always been left unfastened, and the corn had been planted, and the beaver had been trapped, in security and peace. They were anxious that these kindly relations of six and thirty years should not be impaired by his death. They came to Logan, 'their old friend, with whom they had been acquainted for twenty years;' they reminded him that William Penn had made a league with them, to last for three or four generations; that they had lived quietly and in peace, and when the sun set they slept in peace, and in peace they rose with him, and would so continue, while he continued his course. That now William Penn was dead, and most of their old men were dead, but the League still remained; and they wished to renew and strengthen it with their friend, who had always represented William Penn to them since he had left them; that one generation might die and another might die; but the League of Friendship continued strong, and should forever continue so on their part.

"The poor people,' Penn had said, long before, 'are light of heart, but their affections are strong.' They thought, too, of his widow, now made desolate, as well as themselves. They besought Logan to convey to her their words of condolence and sorrow. They brought with them a garment of soft furs, to be sent to her, in their own name, that she might wear it 'in the thorny wilderness through which she was to travel,' now that he was gone.

"At length Governor Gordon, the first governor who came from England after the death of William Penn, arrived in the province. He assembled the Indians, in council, at Conestoga, and allayed their apprehensions. He told

them, that William Penn had continued this kind love for them, until his death. He assured them that Penn's sons, in whose name he came, had strictly charged him to love the Indians like brethren, and as their fathers had done. He reminded them that when William Penn first brought his people with him over the broad sea, he 'took all the Indians and old inhabitants by the hand, and because he found them a sincere and honest people, he took them to his heart and loved them as his own, and made a strong league and chain of friendship with them, by which it was agreed that the Indians and the English, and all Christians, should be as one people.' 'I know,' said he, 'that you preserve the memory of these things among you, by telling them to your children, and they again to the next generation, so that they remain stamped on your minds, never to be forgotten. I now speak to you of the League and Chain of Friendship first made by your father, William Penn, which is confirmed. The chief heads, or strongest links of this chain, I find are these nine, as follows:

"THE NINE LINKS.

"First. All William Penn's people, or Christians, and all the Indians shall be brethren, as the children of one father, joined together, as one heart, one head, and one body.

"Second. All the paths shall be open and free to the Christians and Indians.

"Third. The doors of the Christians' houses shall be open to the Indians, and the houses of the Indians shall be open to the Christians, and they shall make each other welcome as their friends.

"Fourth. The Christians shall not believe any false rumors or reports of [about] the Indians, nor the Indians believe any such rumors or reports of [about] the Christians, but shall first come, as brethren, to inquire of each other; and both Christians and Indians,

when they hear of any such false reports of [about] their brethren, shall bury them in a bottomless pit.

"Fifth. If the Christians hear any ill news, that may be to the hurt of the Indians, or the Indians hear any such ill news, as may be to the hurt of the Christians, they shall acquaint each other with it speedily, as true friends and brethren.

"Sixth. The Indians shall do no manner of harm to the Christians, nor their creatures, nor shall the Christians do any hurt to the Indians, but each treat the other as brethren.

"Seventh. As there are wicked people in all nations, if either Indians or Christians shall do any harm to each other, complaint shall be made of it by the person suffering, that right may be done; and when satisfaction is made, the injury or wrong shall be forgotten and buried in the bottomless pit.

"Eighth. The Indians shall in all things assist the Christians, and the Christians shall assist the Indians against all wicked people who disturb them.

"Ninth. Both Christians and Indians shall acquaint their children with this league and firm chain of friendship made between them, and it shall always be made stronger and stronger, and be kept bright and clean, without rust or spot, between our children and children's children, while the creeks and rivers run, and while the sun, moon and stars endure."

"Tawenna, the Conestoga Sachem, replied in the name, and on behalf of all the Indians of the several tribes who were present: 'Since our first friendship with William Penn, we never have received any wrong or injury from him, or any of his people. Foolish people among us have committed follies, but we hope these will never interrupt the friendship that is between us, for we and all William Penn's people are as one people, that eat, as it were, with

one mouth, and are one body and one heart.'

"Thus are the site and the attendant incidents of the Treaty known; thus are the object and actual articles of the compact made certain. One act alone appeared to be wanting, to show that it had been adopted and ratified with the most solemn sanctions. The evidence of that act, you, sir, (to Granville J. Penn,) have now supplied. You have placed in our hands the expressive symbol by which Indian confidence was secured, and Indian faith irrevocably pledged. Like the memorial column raised in patriarchal days, the Belt of Wampum, delivered and received, made the promises that accompanied it immutable with the red man, as long as the symbol was voluntarily kept. 'These belts that we give you,' said the Oneidas to Governor Lloyd, 'are after the fashion of a pledge to the answer of what we have spoken to you.' With the importance of the event it was intended to commemorate, the belt was enlarged by successive rows; and on occasions of peculiar solemnity, rude pictures were embroidered upon it, which served to designate and preserve, in yet stronger recollection, the important object of the compact.

"When the Nanticokes desired to terminate the bloody feud that had grown up between the Delawares and themselves, their messenger sought out Tedyuscung, the most revered of the Delaware sachems, whose dwelling was among the Kittatinny hills.* 'Brother,' said the messenger, 'the chief man of the Nanticokes has sent me here; he has bid me wipe from your eyes the tears which these troublesome times may have occasioned, and I do it with this string of wampum. Brother, since these troubles arose, you may have swallowed something bitter, which has given your heart uneasiness. With this string of wampum I remove all grief

* The Blue Mountains, of Pennsylvania.

from your heart, that your mind may be as easy as in times of peace. Brother, blood has been spilt. With this string of wampum I clean the blood from off your beds, that you may sleep easily; and from off your council seats, that you may sit with pleasure in council with your brethren. Brother, I am come here to this council-fire to gather together the dead bodies and the scattered bones, and to join with you in prayers to the Good Spirit; and, when peace is made, I will put both my hands into the chain of friendship. To confirm my words, I give you this string of wampum.'

"When Washington, then but a youth of twenty-one, was intrusted, by the Colonial Governor of Virginia, with a mission to the western wilds of Pennsylvania, where the French, from Canada, were then penetrating, and had already established, as was believed, four posts within our limits, and were seeking to unite the natives in alliance against us, he arrived at the banks of the Ohio, having made the journey—let me say in parenthesis—from the capital of Virginia in five and twenty days, the rate of travelling thither in those times. Gathering the Indians around him, he found that such an alliance had indeed been formed. He found that they had exchanged with the French, as its solemn symbol, a wampum-belt, on which four houses were rudely embroidered—the representations of the posts, which were to be defended, even at the risk of war. Influenced by his remonstrances, the Indian sachems consented to withdraw from the alliance; but they declared, that the belt of wampum must be returned before the agreement could be abolished; and one of the sachems repaired to the French commander, in order to restore to him the token of the warlike compact, and to proclaim the intention of the red men to take no part in the impending struggle.

"This Wampum-Belt, which you now place in our archives—this symbol of a

peaceful and confiding alliance—never was recalled, nor was its counterpart returned. Embroidered with the rude but significant emblems, which describe the nature, and proclaim the importance of the compact it was meant to bind—the clasped hands of Penn and an Indian chief—it has been preserved, as it was delivered, nearly two centuries ago. By Penn it was carried to England, and retained by him as a cherished memorial of the event ever present in his thoughts, up to the last moment of his life. When the Indians heard of, and bewailed his death, they exclaimed, that the covenant made between them still remained untarnished, and they only besought, that the compact made at Shackamaxon should be kept by his successors, as he had kept it, through all future time."

INDIAN CEREMONIAL.

"Every [Indian] king has his council, consisting of all the old and wise men of his nation, which, perhaps, is 200 people; and the young men, too, are consulted upon any matter of moment. It is admirable to consider, how powerful the kings are, and yet how they move by the breath of their people. I have had occasion to be in council with them, upon treaties for land and to adjust terms of trade. Their order is thus: the king sits in the middle of a half-moon; and has his council, the old and the wise on each hand. Behind them, at a little distance, sit the younger fry in the same figure. Whilst speaking is going forward, on either side, not a man throughout the assembly either whispers or smiles. On one of these occasions, a young man made a speech to me in the name of the king, stating that the reason they had not given me a definite answer, at the time of the previous meeting on the same subject, was, that they were not certain that all the Indians then present, understood it. Anyhow, that they wanted time to deliberate; but were

"now ready, etc. Another made a "speech to the Indians in the name of "all the Sachamakers, or Kings. 1st. "To tell them what was done. Next: "To charge them to love the Christians, "and particularly, to live in peace with "me [Penn], and my government. That "many governors had been in the river; "but that no governor had come him- "self to live there before; and having "now such a one, who treated them "well, they should never do him, or his, "any wrong; at every sentence of "which they shouted; and, in their "way, said: Amen. * * * When "the purchase [of land] was con- "cluded, great promises passed between "us of kindness and good neighborhood, "and that the Indians and English "must live in love as long as the sun "gave light."—WM. PENN.

According to Captain Civility, the interpreting chief at Gov Gordon's conference with the Indians at Conestoga, May 26th, 1728, Penn's First Treaty was to be binding "as long as "the creeks and rivers should run, and "sun, moon and stars endure."

It was an idea of the proprietary times, that the whites and Indians could live together in harmony, upon the same soil. The Indians believed it, and so did the whites, till they became thickly settled, when the inconveniences appeared, and the poor Indians were driven away.

THE PLACE OF THE TREATIES.

In perusing any of the memoirs of this general transaction, except perhaps that of Du Ponceau and Fisher, in conjunction with the speeches of Granville John Penn, Esq., and Henry D. Gilpin, a vague feeling of unsatisfaction annoys the mind. Every thing that ever took place upon earth, at some time or other, in the mind of some skeptic or other, will be resolved into a myth. This is the penalty as well of singularity as of greatness; the mere delver after facts, constantly forgetting that the changes

of the divine kaleidoscope must be more surprising, more amazing, than the subtlest human fiction. But when all the narratives and accompanying documents are weighed together, the many little half-remembered, or scarcely glimpsed circumstances, while detached of no value, fall and fit into the gaps of the neglected and supposed fatally-injured mosaic, converting the suspected tradition into an accepted truth. THE ONE GREAT TREATY OF WILLIAM PENN all the Indians and all the whites have constantly, and in the main consistently, referred to in public transactions from within a half generation of the actual occurrence down to this day. But *Sakimazing* was the place of the chiefs, therefore, as certainly the place of the treaties. Though, happily, the enwomanning of the Delawares did not occur at Sakimazing, there, doubtless, the treaties and land sales with and to the Swedes, the Dutch and the English were held, throughout the generation before Penn, and down to this very day. Markham, for the Pennsbury tract alone, and again, both for land and for peaceful influence, with the three commissioners, there sat in conference with the tribes. There Penn confirmed their preliminary compact. There Holme, as President of the Council, bought land in 1685 of Shakapoh and other "Sakamakers," and there William Penn also purchased land and made his two leagues of friendship and love, the *first and Great Treaty of autumn*, 1682, and the second treaty of 1701. Both these latter, in Indian tradition and common acceptance, though nineteen years apart, were confounded, and considered as one.

THE DELAWARES.

As is shown presently, the Delaware Indians, by their own exigencies, were prepared for a life of quiet and pacific intercourse; but the personal influence and example of Penn must have been all-pervading, to so change all savage instincts and modes of thought,

as to lead the descendants of those who knew him face to face, forty years after he became Proprietary, and "three years after his spirit had fled to a better world," to intercede for the pardon, without trial, of one Cartlidge, who had murdered, with circumstances of extreme cruelty, the first Indian ever killed in Pennsylvania by a white man. Other and worse murders followed. The second treaty is recalled by a remark of Dr. Franklin, who observes "of the Indians murdered at Conestoga, *Shehaes* was a very old man, having assisted at the *second treaty*, held with the Indians by William Penn in 1710."

INDIAN RECOLLECTION

AND COMMEMORATION.

At the time of the treaty of Fort Stanwix,* I was adopted into the family of a chief of the Tuscaroras, a celebrated and distinguished warrior, who gave me one of his own names, *Tegochtias* or *Paroquet*; and was "much pleased" with my being one of the young people of the country of the much-respected and highly-esteemed *Onas*, or Penn.—JUDGE RICHARD PETERS

Well pronounced, by Du Ponceau and Fisher, as a man worthy of the most unqualified credit in what he says of his own knowledge, the venerable Heckerwelder, an eye-witness, speaking of the Indian tribes of Pennsylvania, remarks their great aversion to holding treaties, save in the open air. He then proceeds to relate what the Indians themselves told him of the conduct of William Penn, who, "when he treated with them, "adopted the ancient mode of their ancestors, and convened them under a "grove of shady trees, where the little "birds on their boughs were warbling "their sweet notes." This historian continues: "In commemoration of "these conferences, (* * * always to the "Indians a subject of pleasing remem-

"brance,) they frequently assembled together in the woods, in some shady spot, "as nearly as possible similar to those "where they used to meet their brother "*Miquon*,* and there lay all his words, "and speeches, with those of his descendants, on a blanket, or a clean piece of "bark, and with great satisfaction, go "successively over the whole. This "practice, which I have frequently witnessed, continued till the year 1780, "when the disturbances which then took "place put an end to it, probably forever."

They had, in their strings and belts of wampum, an artificial memory, refreshed by constant revision.—The Chief GHESAONT. LOSKIEL. DU PONCEAU. FISHER.

Thus it seems that the lapse of one hundred years—three generations—had not begun to obliterate the feeling of the thorough equity and goodness of William Penn, stamped upon the minds of this strong and noble race, for it must be remembered that the Delawares—never weaklings—were originally of the fiercest; were only restrained to the figurative "condition of the woman" by their sense of honor to their grand preservative compact; that, in later years, the mediatorial office, being rendered useless by the presence of the whites and the totally altered state of the red men, the Six Nations were constrained, in formal treaty, figuratively, to return their relinquished, manly right of war, and that at this instant the warriors of the Lenape are more dreaded by the Western savages than any of all the tribes; their very name being the squaw-nurse's frightening-word to her refractory papoose, a thousand miles from their present seat beyond the Mississippi. And not unlikely their wise men still impress upon the hearts of the ardent youths of this fast dwindling nation the abiding sense of the perfect faith and unequalled virtue of William Penn.

* Built in 1758, upon the spot where Rome, New York, now stands.

* Or, "*Onas*."

It will readily be understood, from the Indian method of recalling past events, that dates are much more apt to be confused, or forgotten, than facts. Also, that, when the account passes to another band, without the strings and belts of wampum, whose existence in the participating tribe renders the matter far more documentary than traditionary, two or more very similar events, between the same general parties, are very apt to be fused into one. Yet there is great probability in the reminiscence of Civility, the chief and interpreter, in Governor Keith's conference with the Conestogas in 1722. Some doubt is thrown upon the claim of a parchment passing from Penn to the natives in 1682, though there may have been such a scroll, embodying a few general principles, as the white man's token for the red man's wampum. At any rate, Civility claimed, that Penn, to confirm the Great Treaty, gave the Indians a parchment-roll, and told them to preserve it carefully for three generations, that their children might see and know what had passed in council, as if he had remained personally with them to repeat it; and that the Christians might recall and respect it; but that the fourth generation would forget both him and it. This seems to have been prophetic, whether spoken by Penn, or invented by the Indian orator; for the fourth generation were the actors of the American revolution, and did forget both him and it.

Clarkson relates that on the day appointed for the treaty, William Penn, with his friends, men, women, and youths of both sexes, travelled from Chester fifteen miles to Coaquannock, where they met the Indians, so numerous that they swarmed in the woods as far as eye could reach, and looked frightful, both on account of their number and their arms. West, the painter, also, in his picture of the Treaty, gives the natives arms. As we shall see directly, they could not have been armed; but their

peace toilet, to those unacquainted with Indian customs, would be quite as terror-striking as war-paint. The Indians never take arms to treaties. Heckewelder says: "They do not even permit a warlike weapon within the limits of their council-fire, even when assembled for ordinary business."

THE LENNI LENAPE.

The simple fact is, that these Indians, passing with us as aborigines, who, in the superficial notions of Reynal and Voltaire, stood gloating upon the shores of the Delaware, ready to devour Penn and his devoted followers, had been prepared for the reception of humanizing propositions long before. According to universal tradition among the northern Indian nations of North America, the *Lenni Lenape**—known to the French as *Algonquins*, to the English as the *Delawares*—from far to the west moved eastward, united with the *Iroquois* or *Mengwe*, and conquered the *Allegewi*, a nation powerful, warlike, and of large stature, with many large cities. The struggle was protracted and doubtful. Bloody battles were fought, and large mounds of earth heaped over the slain. At length the newer and less civilized barbarians triumphed, and the *Allegewi* fled down the Mississippi, never to return. The conquerors reported of themselves that they had previously sought permission of the *Allegewi* to pass peaceably through their country, and were refused; and determined to force their way, and succeeded.

THE ENWOMANING OF THE DELAWARES.

The victors divided the country, the *Iroquois* taking the northern portion along the *fresh water lakes* and the *great river*, St. Lawrence. The *Lenape* crossed the *Alleghenies*, and discovered the *great salt water lake*, Atlantic. They called

* That is, the original people.

the Delaware *Lenape-wihittuck*, or the *rapid river of the Lenape*, and extended themselves to the Potomac, Susquehanna and Hudson. In course of time they divided into three tribes, the Turtle, the Turkey, and the Wolf. The Turtle and the Turkey held between the seacoast and the mountains; the Wolf, or *Minsi*, tribe lighted their council-fire at Minniskink, about twenty-five miles west of Newburgh, on the Hudson. The *Mohicanni*, or Mohegans, and all the tribes of the southern and eastern shores of New England, derived from, and were styled the *grandchildren* of, the Lenni Lenape, who were always enterprising and replete with savage virtues. But, as just before the establishment of the English settlements there, a pestilence assimilated to the yellow fever, had swept off nine-tenths of the Indian inhabitants of New England, so a similar depopulating preparation for European enlightenment had been made in the more western and southern regions. Sanguinary wars between the Mengwe and the Lenni Lenape races had sorely wasted all the tribes alike; and a peaceful mediatorship arose in the grand council of the Delawares. However singular, this is authentic, that the latter, though greatly respected, and honored with the title of "grandfather" by many tribes, were yet, by their own admission, reduced in making war, the only real business of Indian life, to the condition of women. The Iroquois, Mengwe, or Five Nations, boasted that their prowess and generalship had occasioned this, although, as the most noble are originally the least suspecting, and never adequately on guard, save with open foes, it looks more like the result of guile. The Lenni Lenape, or Delawares, explained it as the effect of an embassy from the Iroquois to this purpose: "It is not profitable that all the nations should be at war with one another, for this will finally be the ruin of the whole Indian race. There is only one remedy. One nation shall be the

"WOMAN. We will all defend the woman. She shall not go to war, but speak words of peace, and warn those walking in foolish ways. The men shall hear and obey the woman." The Delawares consented. A grand council followed, wherein the Iroquois declared in their figurative style: "We dress you in a woman's long habit, we give you oil and medicine, a plant of maize, and a hoe; to your care we commit the great belt of peace and the chain of friendship."*

Now, it is obvious, that there being but one other great nation, of neither *Mengwe* or *Lenni Lenape* blood, in their whole region, namely, the *Wyandots*, *Hurons*, or *Adirondacks*, as they were indifferently called, and they far to the north, while the Iroquois strictly kept this pledge, all the sept, together, were benefited; but, if the Iroquois warred with the *Wyandots*, or even with the *grandchildren of the Delawares*, as long as they refrained from directly warring upon the Delawares, these having given up the power of war, and accepted the great belt of peace, could not interfere, but merely remonstrate and advise. Thus, much against their will, they fell into a secondary position, though always asserting their voluntary adoption of this mediatorial condition. They could the less escape from this state, because the Iroquois had really conquered the *Adirondacks*, and so acquired a boasting confidence the Delawares could not very well withstand. This relation of the Delawares accords much better with the respect voluntarily paid them, and the weight of their counsels, than the version of the Five Nations. Still, we find, traditionally, from Judge Peters, that the Six Nations considered themselves the masters of all the nations with whom William Penn had dealings in his time.

* The Delawares say, that this compact was made at Norman's Kill, a mill-stream emptying into the Hudson, one and a half miles below Albany, N. Y., some time between 1609 and 1620.—JAM S N. BARKER.

A SAVAGE THICK SETTLEMENT.

The general conception, touching the actual mass of a population of savage hunters, in proportion to the area of any particular region, is very vague. When beginning, to themselves, to be inconveniently crowded, they will not average more than one Indian to a square mile. Then, instead of being distributed evenly throughout the habitable parts of the continent at this rate, they were in scattered clusters, rarely leaving tracts, streams or lake shores, whereon they found a living, or sought a foe; and as utterly ignorant of most of the land they inhabited, as is the civilized mariner of the ocean beyond the sweep of the trade-winds. The white man encountered the Indian, because the white man kept to the general passes of the country, outside, or between which, were extensive tracts, as new to the red man as to the white.

THE UNWOMANING OF THE DELAWARES.

This peace-making dignity of the Delawares was probably instituted in the time of the grandsires of those who treated with William Penn; but the body of the nation were growing restive, and, in the days of the grandsons of the participants in Penn's treaty, the Delawares having been in the interim, throughout a disturbed and troublous period, much engaged in war, and the Iroquois being greatly weakened, the compact was abrogated, as formally as it had been entered into. Judge Peters says, September, 1825: "Fifty-seven 'years ago' [in 1768] 'I was present 'when the Delawares and Shawanese 'were released by the Iroquois or Six 'Nations (originally Five) from the 'subordination in which they had been 'held from the time of their being 'conquered (!). The ceremony was 'called taking off the petticoat; and 'was a very curious spectacle.' Here, we are only sorry that he did not describe it at length, as the 'taking off' would have been the converse of the

"putting on." It will be marked that, from intermediate alliance, two southern tribes were involved, not parties to the original transaction, one on each side, namely: the Monacans or Tuscaroras, and the Suwanees or Shawanese. In 1770, the seat of the combined Delawares and Shawanese was in the eastern parts of the present State of Ohio.

In the interval between Penn's first and second visits, about sixty families of Shawanese, driven from home in the south by Indian wars, settled at Conestoga. We hear of them in 1698. They seem to have applied to the government, in 1682, for protection, which Penn, arriving shortly afterwards from England, granted. Fresh difficulties were settled afterwards by Penn on his second arrival, in 1701.

THE PENNS WELSH.

Onas, a Pen, or Quill, a literal translation of the most obvious sense of Penn's name, which, however, is most likely from the Welsh, and, in that case, means a *Mountain*. It is a pity the Indians were not informed of the true etymology, as their oratorical imagery would have been much improved. It lends a certain color to this assumption, that the new name given to Upland, which became the seat of government, was Chester, a town in England, upon the marches of Wales, and anciently within the boundary of the latter kingdom; although we are told that Penn gave the name "in remembrance of the city whence his friend and companion, Pearson, came."

In the following letter to Robert Turner, although Penn does not absolutely say his own family is Welsh, his remarks strongly assist our theory:

FIFTH OF FIRST MONTH, 1681.

TO ROBERT TURNER:

DEAR FRIEND:—

My true love in the Lord salute thee, and dear friends, that love the Lord's truth, in those parts.* Thine,

* Dublin, Ireland.

I have; and, for my business here, know: that, after many waitings, watchings, solicitings, and disputes in council, *this day MY COUNTRY WAS CONFIRMED TO ME, under the great seal of England, with large powers and privileges, by the name of PENNSILVANIA*, a name the king would have given it, in honor of my father. I chose *New Wales*, being, as this, a pretty hilly country; but *Penn* being Welsh for a head,* as *Pen-man-moire*,† in Wales, and *Penrith*, in Cumberland, and *Penn*, in Buckinghamshire, *the highest land in England*, they called this *Pensilvania*, which is *the high, or head, woodlands*;‡ for I proposed, when the secretary, a Welshman, refused to have it called *New Wales, Silvania*; and they added *Penn* to it, and though I much opposed it, and went to the king to have it struck out and altered, he said 'twas past, and would take it upon him, nor could twenty guineas move the under-secretaries to vary the name, for I feared, least it should be looked upon, as a vanity in me, and not, as a respect, in the king, as it truly was, to my father, whom he often mentions with praise. Thou mayst communicate my grant to my friends, and expect, shortly, my PROPOSALS. 'Tis a clear and just thing; and my God, that has given it me, *through many difficulties*, will, I believe, bless and make it the seed of a nation. I shall have a tender care to the government, that it will be well laid at first.

No more, now, but dear love in the truth.

Thy true friend,

W. PENN.

The Penns of Stoke-Pogis, (Buckinghamshire, England,) whose church and burial ground form the locality of Gray's Elegy, were settled at an early period at Minety, Gloucestershire, and at Penn's Lodge, Wiltshire. Now the county of Gloucester is in the west of

England, adjoining Wales; and Wilts is contiguous to, and immediately south of Gloucester. Buckingham is a mid-England county; but the Penns were not seated here till after the times of Admiral Penn and his son, William, the Founder, the estate of Stoke having been purchased from the executors of Lady Cobham, in 1760, by Hon. Thomas Penn, Lord Proprietary of Pennsylvania. The Delawares being under the tutelage of the Five Nations, adopted the Iroquois term *Onas* in their public speeches; but when among themselves always called him by the Lenni Lenape term *Miquon*, a word of the same signification.

THE PENN ARMS.

The arms of the Penn family are: Argent, on a fess sable, three plates. Crest, a demilion rampant argent, gorged with a collar sable, charged with three plates. Motto:



DUM CLARUM RECTUM TENEAM.



THE HAND-BOARD.

Even when in the immediate neighborhood, the curious stranger, or the townsman of leisure from another part of the city, would probably have some little difficulty in finding the memorial obelisk of the Penn Society. It is very closely encompassed by the remains of its own enclosure of white palings, tolerably perfect on the Beach street front and the two sides. The back is gone; but that, under the circumstances, makes no difference, as its place is supplied—upon the old line—by the back of a square enclosure of thickly-placed, unpainted, darkly-weathered palings, about twice the height of the memorial itself. Directly east of this, or up Beach street,

* Or mountain.

† Pen-maen-mawr.

‡ Poetically, *The Alpine Forest*, or better, *The Mountain Wood*.

is Gorgas's brick counting-house, one story high, with far-projecting eaves; and a few rods west stands the Vandusens' counting-house, also one story in height. Between Gorgas's office and the outer rough enclosure up-springs the flourishing young offshoot of the Great Elm, straight, tall, and symmetrically developed, with the sprays of its over-arching, down-sweeping branches almost resting upon, and projecting well beyond, the top of the obelisk. Directly alongside this outer enclosure, on the west, or down Beach street, grows a healthy and handsome young button-wood, whose branches and sprays interlock with those of the elm. The buildings, on the same side of the street, east and west of Gorgas's and Vandusens' offices are large and several stories high. The cord-wood piles in Gorgas's yard almost touch the obelisk enclosure, and, resting against it, in Vandusens' yard, are piles of ship-timber. The outer palings, besides being tall, are pretty close together, and the dull brown of their exterior harmonizes with, and sinks into, the commingled subdued yellows and browns of the wood and ship yards. What contrast the dull white marble, of the memorial monolith, would make with all this, is quite dissipated by the glimmering white palings just around it; and the uncertainty is increased by the shades and shadows of the two trees. Altogether, the quietness of hue and tone is such, that an unaccustomed glance along Beach street, in either direction, would probably fail to find the stone, which, in its public seclusion, it requires a scrutinizing eye to detect. The surest method for the stranger, starting from the heart of the city, is to take the Eighth and Diamond street cars to Eighth and Girard avenue, procure a pass, for down the avenue to the Delaware, and tell the conductor to stop at the Penn Treaty Monument, in Beach street below Palmer. The car of the same line will pick up the visitor at the same spot, and, by means of a Fourth

street pass, convey him back again to the centre of the city.

The river front and the line of Beach street, on and immediately about the Treaty-ground—inside the limits of the plot, whose purchase we recommend for public use—include a range of heavy business, the managers of which—from the ease, celerity, and certainty of their mechanical facilities for doing heavy and difficult work, and the skill and adroitness of their mechanics and mechanicians—would certainly be considered as great medicine or mystery-men by any straggling braves of the dwindling remnant of the Lenni-Lenape, who, from the distant banks of the Arkansas, or the Canadian, should visit the shores of the Lenap-Hittuck; or by any of the shades of the tribe of Tamanend, of the Nation of the Woman, who could leave the spirit-land and revisit their ancient hunting-ground. And symbolizing the Treaty vicinage of the present day, by characterizing its possessors in their most complimentary style, both embodied and disembodied souls would verily and veritably say, "*This is the place of the eels.*"

THE TRUE MERIT OF THE FOUNDER

In the cogent reasoning and elegant reflections of Du Ponceau and Fisher: "It is not upon this [the "great treaty], that depends the fame "of our illustrious founder; nor is it on "his having purchased his lands of the "Indians, instead of taking them by "force. Others before him had made "treaties of friendship and of alliance, "with the original possessors of the "American soil; others had obtained "their lands from them by fair purchase: "in Pennsylvania, the Swedes, the "Dutch, and the English, who governed "the country during the space of eigh- "teen years under the Duke of York, "had pursued the same peaceable sys- "tem. It is, therefore, not only unjust "but it is extremely injudicious to en-

"deavor to ascribe to William Penn
 "the exclusive merit of a conduct
 "pointed out, not only by the plainest
 "rules of justice, and the example of his
 "predecessors, but also by prudence and
 "the soundest policy, particularly, when
 "it is considered, how much easier and
 "cheaper it was, to purchase the lands
 "of those savage tribes, than to attempt
 "to take them by force, which, in the in-
 "fancy of colonies, would not have been
 "an easy task. When the European
 "writers praised William Penn so highly
 "for having purchased his lands of the
 "Indians, they meant to place his con-
 "duct in opposition to that of Pizarro
 "and Cortez; and although they attrib-
 "uted to Penn alone, a merit to which
 "he was not exclusively entitled; they
 "could not have chosen a fitter per-
 "sonage to make the strongest contrast
 "with those destroyers of their fellow-
 "men."

In fact our founder was his own ex-
 emplar, for Penn himself, the chief in-
 strument in settling West New Jersey,
 directed at the start, in 1677, that the
 lands should be purchased from the In-
 dians.—ROBERTS VAUX.

To resume Du Ponceau and Fisher:
 "The true merit of William Penn, that
 "in which he surpasses all the founders
 "of empires, whose names are recorded
 "in ancient and modern history, is not
 "in having made treaties with, or pur-
 "chased lands of the Indians, but in the
 "honesty, the integrity, the strict jus-
 "tice with which he constantly treated
 "the aborigines of the land; in the
 "fairness of all his dealings with them,
 "in the faithful observance of his prom-
 "ises, in the ascendancy which he ac-
 "quired over their untutored minds; in
 "the feelings of gratitude with which
 "his conduct and his character inspired
 "them, and which they, through succes-
 "sive generations, until their final dis-
 "appearance from our soil, never could
 "nor did forget, and to the last moment
 "kept alive in their memories."

POWERS OF THE PROPRIETARY.

No man, not absolutely a monarch,
 ever ruled with more power, than that,
 by England's charter, devolved upon
 William Penn. He had sought it
 purposely, in order that he might ef-
 fectually restrain his lineal successors.
 He had free use of all ports, bays, rivers
 and waters; and all islands, mountains,
 soils, mines and their produce were
 wholly granted to, and vested in him.
 He was made absolute Proprietary of
 the territory, to be held of the crown in
 free and common socage and fealty only,
 at a rent of two beaver skins payable to
 the king annually, and a royalty of 1-5
 of all the gold and silver discovered.
 He had the power of making laws, with
 the advice and assent of the freemen of
 the territory assembled, for raising
 money for the public uses; of ap-
 pointing judges and other officers; of
 pardoning and reprieving, except in
 cases of high treason and murder—re-
 prievie in these cases to be granted only
 till the pleasure of the king should be
 known. All the laws made in the prov-
 ince were to be agreeable to reason and
 not repugnant to those of England;
 duplicates of them to be sent to the
 Privy Council within five years after
 their passage; and, if within six months
 after their transmission such laws were
 not pronounced void by said council,
 they were to be held approved and valid.
 He could divide the province into hun-
 dreds, towns and counties; could erect
 towns into boroughs, and boroughs into
 cities; could with the advice of the as-
 sembled freemen, assess reasonable cus-
 toms on goods laden and unladen, re-
 serving to the king imposts established
 by act of Parliament. He was not to
 maintain correspondence with any
 power at war with England, nor make
 war with any power in amity with Eng-
 land. Any doubts as to the manner of
 construing any expression of the charter
 to be resolved in the manner most favor-
 able to Penn and his heirs.

PROFESSION MADE PRACTICE.

William Penn thoroughly comprehended, and determined to establish in a virgin land, unawed and untrammelled by precedent or authority the principles of republican constitutional liberty. In proof of this, mark the following extract from a letter written in the blossom of his Proprietorship.

"WESTMINSTER,
12TH OF 2D MO., 1681.

DEAR R. TURNER,
ANT. SHARP,
AND

R. ROBERTS:

* * * * *

For the matters of liberty and privilege I propose, that which is extraordinary; and, *to leave myself, and successors, NO POWER OF DOING MISCHIEF; that the will of one man may NOT HINDER THE GOOD OF AN WHOLE COUNTRY* But to publish these things, now and here, as matters stand, would not be wise; and I was advised to reserve that, till I came there.

* * * * *

W. PENN.

[Robert Turner,
Merchant,
At his house
in Dublin.]"

Mark, also, that this profession was immediately confirmed by practice, on Penn's first conference with the Representative Assembly of Pennsylvania; the action then irrevocably taken, establishing the liberties of this Commonwealth upon their present basis.

THE PURPOSE, AGAIN.

To return to our main object: We ask—and the circumstances justify us in asking—this great Commonwealth to purchase and set aside, for the encouragement and use of all her sons and daughters, the tract of ground between Palmer and Marlborough streets and Richmond street, and the river Dela-

ware, which, when its water-front is extended to the Port Warden's line, will be about 950 feet square, containing, in its very centre, the exact site of the Great Elm Tree, the tree itself to be replaced by a monument, noble and lofty, serving to commemorate both the Lenni-Lenape and the Founder; but specially dedicated to William Penn. The designs for this will exercise the highest soaring, the most imaginative, of our architects; and the selected one may stamp one of them as great; but we now strive to incite the members of the whole community to determine: Firstly:—that this thing shall be done:—Secondly:—that they will immediately proceed to do it. The ground acquired, and a fair and large proportion of the money for embellishment paid in, it will then be time to discuss the means of adornment. For action, the present moment is the best.

Inadequately as the writer has herein skimmed the chronicles, in order that the casual reader may have at least an index to the greater bearings of the subject, it needs few words to convince the generous mind, that the Delaware Indians ought to be honored with the accessorial parts of this monument. Possessed of a language far superior in construction to any other of the Indian tongues, and described by Penn himself as, like the Hebrew, "narrow and lofty; but, in signification, full"—as a tribe, they are memorable in other points:—in none more so—apart from their relation to Penn—than in their "woman" mediatorship among their congeners. What, however, was entered into, when they were amply able to cope with their opponents, was purposely misconstrued by the devisers of the scheme, and, practically, the Delawares never regained their old position in Indian blazonry, until long after the arrival of the whites, when it really mattered little to any of the parties concerned. The remnant of the Lenni-Lenape retired from the shores of the Delaware between 1740 and 1760.

In 1741 a few lingered in the forks of the Delaware. Being in the way of the whites there, it was thought best to send for Canassatego, a chief of the Mengwes, who harangued the Delawares in council in a style, probably much more forcible than agreeable. He said: "We conquered you in battle. We made women of you. Retire to the other side of the Delaware." And the Lenape implicitly obeyed.* This was hardly the result of acquiescence in Iroquois right, but, rather, submission to the preponderant weight of Iroquois numbers. According to the Indian practice, had the Mengwe really conquered the Lenape, the latter would have been fairly merged in the different tribes of the victorious confederacy. Thus we see uprightness temporarily failing before finesse, and the insinuating profession of comity quickly changing into the arrogance of intolerable oppression. It was no more than poetical justice that, at Fort Stanwix,† on the Mohawk, the heart of their own country, the crafty descendants of the crafty Mengwe should be obliged forever to abjure any semblance of superiority over the descendants of the very Lenape, who, at Norman's Kill, near the Hudson, in deference to the general Indian weal, had formally renounced Indian warfare. And so the waters of the Mohawk—from the far-off region of the greater and the lesser lakes—ever sweeping past the mouth, and mingling—in the bosom of the Hudson—with the waters of Norman's Kill, constantly murmur, "Once upon your banks, one great tribe was deceived by another, through a great wrong; but long after, upon our shores, that wrong was redressed, to be repeated never more."

MONUMENTS NOT QUAKERLY:

BUT

PEOPLE-LIKE.

Not with the consent of William Penn

himself, if he were living, not with the approbation of the Society of Friends, to which he belonged, could we erect a Monument to the Founder of the Commonwealth of Pennsylvania. But the separatists of one era are the moderatists of the next. Sects, as well as men, have their appointed time, and die; but whatever they possess of real truth lives on forever. That which is in harmony with nature endures, but that which is contrary to nature perishes.

The Friends, in many respects, have modified their practices, if not their tenets. They once eschewed representative art of every kind. Now they have choicely illustrated books upon their tables, and fine engravings upon their walls. Not unlikely, too, some of them may confess and indulge a taste for statuary. At all events, it is not upon our dead worthy, or on the children of his co-religionists, that we have now to work; but upon the great outer world, including, we fear, much of the flesh, although not altogether destitute of the spirit.

The Friends, themselves, are a living monument—of a very sturdy material, though, it must be confessed, of the plainest possible design and execution—to the Memory and Divine Love of the SAVIOUR:—in the grand in-gathering of creeds and works, at the fulness of time, to be one of the blocks of that ever-during monument of human souls, designed and erecting—without the sound of a hammer,—without the motion of a hand,—without the word of a lip,—in—by—to—and for—the GLORY OF GOD.

THE CHARACTER OF PENN

We, certainly, cannot add one particle to the good fame of Penn. The son of an Admiral and a hero, himself a hero yet greater; far and well descended, through both father and mother; handsome and accomplished; the pet of fortune; the companion and the favorite of kings; he yet dared differ

* James N. Barker.

† Rome, N. Y.

with the fashion, both in profession and in morals, and frequented palaces, without a flaw in his integrity. Riches, pleasure, power, rank, office, wooed him, on the one hand; ridicule, contumely, neglect, buffetings, imprisonment and the stern disapprobation of a loving father, threatened him upon the other. He might choose as he pleased, but was implored to beware. All these threatenings were followed by acts stern as themselves. Then there was a respite, and again he was besought to consider. He might think as he pleased, if he would only say nothing; and throughout his life all would be well. Yet he chose to speak his own thoughts, although he knew himself to be embracing trouble and sorrow; and his father gave him up as incorrigible and one he could not help; but only, however, to become, at length, fully and finally reconciled to the course of a son, whose attainments, qualities and conduct afforded him a just pride, no matter how badly the youth mistook the thriving way of the world. The peerage, they both might have had in turn, was, in accordance with the wishes of the younger, put aside for a prospective province, wherein might be set in action some of the very peculiar notions on government embraced by William Penn. The brave and keen old father died; and, after much difficulty and delay, the son secured the charter of an undefined wilderness, which, however it appeared then, was, in truth, a richer principality than the proudest ever known in Europe. Yet a principality only destined to make its beneficent owner poorer, until, finally, in the sickness of his latter days, and the bitterness of his spirit, he was constrained to mortgage, and had even determined to sell it, though, haply, it was preserved to his children; and, while not rating highly in his lifetime, turned out to be much the better portion of the family estate. With many and warm friends, among all classes of society, both in the old

world and the new, beside his family and his religion—apparently his only compensating sources of comfort—he was foully belied by blatant enemies, and scandalously wronged by the ungrateful steward, Ford. Ostensibly and, indeed, really rich, yet, through all his days, hampered in his large and just designs, as by pinching poverty; persecuted and imprisoned for his religion; pursued at law and again imprisoned through the heirs of the over-trusted agent, who had misapplied his substance and kept him poor; the personal friend of Queen Anne, as he had been of her grand-aunt, Elizabeth of Bohemia, her uncle, Charles II., and her father, James II., and in his age, as in his youth, a constant guest at court; yet harassed with constant anxiety concerning his private affairs; a loving husband and a fostering father; of a sweet temper, a pure character and a never worse vilified reputation; eminently acceptable as author and preacher; a good constitutional lawyer, a forcible advocate, and, as a statesman, great and comprehensive; his splendid stamina and his buoyant spirit succumbed at last to prolonged pressure, beyond even the strength of his superior human powers; and, falling suddenly into ill-health, which lapsed into a general decline, he lived on for ten years, with greatly impaired faculties, though still blessed with patience and hope; and died, between two and three o'clock, on the morning of the thirtieth day of July, 1718, in the seventy-fourth year of his age. From the instant of his death, until within the last two decades, his reputation rapidly augmented and improved, until he was, by universal historical consent, placed with the very highest of the very few, like Alfred and Washington, world-known as both great and good. But latterly, a successful statist and most eloquent historian, in very wantonness, speciously assailed the fair fame of the Founder, only to have a score of eager and able champions so

thoroughly traverse and refute his gratuitous slanders, that, more than ever lustrous, William Penn, sun-like, beams upon an admiring world with scarcely a spot.

THE EXEMPLAR.

It is, therefore, in English and American history—in all history—as the only worthy successor to Alfred, and the only worthy antecessor of Washington—the lives of all three of these men having been throughout and thoroughly based upon the everlasting principles of truth and right—among the few born leaders of mankind in all good and deterrents in all evil, that we have to number William Penn. If the memory of Washington rightly demands, from his revering countrymen, the erection of a monument, and it does demand the erection of many, we must ponder this significant fact: Washington's last, pure, great exemplar, was William Penn. In the light of this pregnant fact, what excuse can Pennsylvania offer to herself, for not erecting as lofty a monument to her modest, but exalted Founder? As a means of education in purity of life, apart from the mental instruction procured from books, it will be an invaluable aid to the system of common schools, whose great advocate in this commonwealth, newly rests beneath the sod. It is idle to say that the permanent public commemoration of individuals partakes of idolatry. It is a thing only possible to the rare few, and to them, it is only the recognition of benefits bestowed by the distinguished dead, upon their own and sequent generations—the acknowledgment that in a world of many dangers and much temptation, this or that man determined to do good, and was enabled to do it. Monuments raised to such great souls, have a constant tendency, while, from self-introspection they improve the whole community, to reproduce similar heroes. It is by such means that true patriotism is kept alive; and liberty and union are preserved against insidious foes forever.

ACTION.

We ask, then, the good citizens of Philadelphia, to enter into this work with heart and soul. Action, organization, and an united aim accomplish much. We hope and expect to see, ere long, a mighty, an effectual movement. The site ordered by the General Assembly once procured, and the popular subscription for the chief memorial and the accompanying embellishments of SAKIMAXING realized, we may be tempted to give our ideas of the proper method of managing the work. But never, until the general points of this long continued and widely extended day-dream, constantly filling the minds of a multitude, shall become a reality, will Pennsylvania accord due honor to the memory of her illustrious founder; and never, until then, will our citizens feel satisfied with the city of his love and theirs. When haply this dream does become a tangible reality, the commonwealth and the metropolis need blush no longer for justice deferred. Then shall Shackamexing be resolved into Sakimaxing. Then shall **THE PLACE OF THE EELS** become once more **THE PLACE OF THE CHIEFS**.

Then as the citizen—or the sojourner, glances admiringly along up the sky-piercing taper of its stately pile, reads its exterior inscriptions and ponders its interior tablets, walks beneath the elmen shade of its grassy plots; scans the rightward incurving river, and views afar the spire of Swedes church, upon the shore of Wicacoa—will the mind recur to the scene in the earlier days of the proprietary. Then will the heart recall "The only treaty between the whites and the red men, never sworn to, and never broken."* And then will the soul feel—that the entire offering—however rich, however noble, however massive, however lofty, however superb, and however it may have drained the fount of sacrifice—is but a slender acknowledgment of thanks to the **GIVER**—for the life—the name—the fame—of **WILLIAM PENN.**

* Voltaire. Dictionnaire Philosophique—verbo, "Quaker."

AMERICAN AND FOREIGN WOODS.

BY GEORGE J. HENKELS.*

AMERICAN WALNUT.

IN a previous communication, we gave a cursory history of the different woods, both native and foreign. This article we will confine to the descriptions and uses of WALNUT.

Beginning with our first knowledge of its adaptability for cabinets, &c., we find that many of the old pieces of furniture, family relics, which were brought out to America by the first settlers, were made of Walnut. The quaint-looking, old escrutoires, cases of drawers, and chairs, which are so much prized for their antiquity, are either made of walnut, or mahogany, both woods being in use in Europe at the general period of pioneer emigration.

As to grain, the walnut of Europe widely differs from our Western walnut, but much resembles the white walnut, or butternut, which is found on the western slope of the Alleghanies.

In Europe, from the scarcity of the wood, they are obliged to work economically, and consume all, even to the roots, which they cut into veneers,† producing from 60 to 100 of these to the inch.

• The process of cutting veneers will be explained at the proper time.

The root of French walnut is beautifully variegated, the markings being map-like, with black lines intersecting the light ground. For panels of *beaufets*, and for ornamenting the plain walnut, by raised veneered tablets, this wood has no equal. French cabinet-makers make the most of it, as they

skilfully piece up the holes in the veneer, which are the natural result of defects in the root. Sometimes a panel-veneer will have a hole in the middle, large enough to put a man's head through; but the natural diversity of figure in the wood, aiding the skill of the workmen, enables them to match or fit in another piece of veneer, which is difficult to detect, in many cases actually adding to the beauty of the panel. Every square inch is pieced up, and worked in cross-banding, giving us an example of economy in the use of wood, which we will do well to follow, as we are notoriously prodigal in working all kinds.

Walnut was first introduced to any extent, as a furniture wood, about 1845. Cabinet-makers had no experience in working it, and were timid about recommending it to their customers. The only kind to be had, on the seaboard, was a very hard-grained Pennsylvania and Delaware wood, such as is now used almost exclusively for gun-stocks. This was prior to the completion of the Pennsylvania Central railroad, and before the States of Ohio and Indiana were aware of the great wealth of their walnut forests, as walnut, to their inhabitants, was of less value than any other wood, being used extensively for fencing. The growing demand, in the Eastern States, induced the shipment of large quantities of a soft-grained northern wood, which was sent, by way of the lakes, to Albany, N. Y., and thence distributed to the Eastern cities. There is still a great quantity of this wood sent by this route, and New York and the New England States depend on it for their principal supply. The Pennsylvania Central railroad is the avenue to market for all of the best Ohio and

† The term veneer (a double corruption—the English being from the German noun *furnier* or *furnir*, and that in turn, from the French verb *fournir*, to furnish) is not confined to wood; but signifies any thin leaf or layer of a more valuable and beautiful material used to overlay an inferior one.

* Cabinet and Upholstery Warerooms, N. W. corner of Thirteenth and Chestnut streets, Philadelphia.

Indiana wood, and Philadelphia cabinet-makers of course have the advantage of the best stock to select from. Throughout Northern Ohio, and in Indiana, Illinois and Michigan, there is in the forests a large proportion of walnut, many of the trees being three to four feet diameter, with a trunk rising eighty feet, without a limb or a defect. All over this territory there are numerous saw-mills, that cut the wood to sizes for the owners of the land, who are mostly farmers. Agents from the Eastern cities establish themselves in a convenient locality, and are prepared to purchase all the timber that is brought to them. During the dull season, when the farmers have but little employment, they cut down their trees, and have them sawed to all sizes and every thickness, from $\frac{1}{2}$ inch to 8 inches, every intermediate quarter of an inch being a marketable dimension. This wood they haul, entirely green, to the agents of the Eastern dealers, and they get the money for each wagon-load, as it is delivered. This lumber is piled up on the ground, and left to remain for from six months to a year, before it is considered marketable. In fact, walnut one inch thick is not fit to work into furniture, until two years have elapsed after the cutting; but the greater part of the cheap furniture, sold in the Eastern cities, was growing in the tree six months previous.

It must not be understood that there are whole forests of walnut alone, as ten to fifteen good walnut trees to the acre is considered a very liberal supply. At the present rate of consumption, it can be but a few years, before we will be in the same condition for walnut that St. Domingo is in for mahogany, that is, possessing plenty of it in many parts of the country, but not within reach.

The grain of walnut is more diversified than that of any other wood. We have plain-grained, striped, blister, curl, mottled, and burl, or wart. Sometimes, from a defect in, or injury to, the sapling, the tree grows crooked, and the

grain interlocks; this results in *striped*, *mottled*, and *blister* wood. The *curl* is in the forks of the boughs, or the principal branches from the trunk. The *burl* or *wart* is produced from disease in the tree; the sap oozes out, and forms a wart, which increases in size with the growth of the tree, till it sometimes reaches the enormous weight of a ton. All of these varieties are reserved for veneering, and are brought, mostly in bulk, to the Eastern cities, where there are a number of appliances for reducing them to veneers.

Until within the last few years, all veneers in this country were cut with *circular saws*. THE VENEER SAW was a specialty, used for no other purpose. It was a cast-iron disc, about five feet in diameter, and from two to three inches thick at the axle, running off tapering on one side to a feather-edge. The saw-plates, containing the teeth, were made of thin steel, in sections of ten to twelve inches wide, conforming to the radius of the disc, on the flat side of which they were nicely fitted into a rebate, and secured by screws, with their heads countersunk, so as to present a perfectly level surface to the log to be sawn. The log was secured to a sliding carriage, and fed to the saw as fast as it would cut. From fifteen to thirty veneers were cut to the inch, varying according to the wood, whether tough or brash. The waste from the saw-kerf* was about one-half, so that American ingenuity was exercised to produce a cutter, that would not waste; and soon produced it. This is A HUGE KNIFE-BLADE, secured firmly in its place. The log to be cut is *first steamed*, to make the wood soft; and then is *suspended*, by heavy gearing, *above the knife*, so that in descending it must have a drawing, or slicing, as well as a downward movement. This machine is capable of cutting 200 veneers to the inch; but, for cabinet-

* *Kerf* is from the same root as *carve*. It is sometimes improperly spelled *curf*.

work, the veneers are too thin at more than 60 to the inch. The thinner veneering is used for wall-hangings, as a substitute for paper, and is so thin as to be transparent.

A new and valuable invention cuts a veneer by A CORRUGATED KNIFE. This method of cutting in and out of the side of a plain striped log, makes a most beautiful wavy veneer, and not only adds to the beauty of the wood, but secures great economy, in the use of fine woods, as *an elegant, natural, grain-figure is produced from a plain log*. Properly to appreciate the advantage of this great invention, we must understand that not one tree in a thousand is good enough for veneers, if cut by the old process; but, *by the corrugated knife, the plainest wood is made handsome*.

Walnut wood should never be kiln-dried, if intended for furniture, or interior work in dwellings. When steamed, and afterwards dried in a kiln, the wood loses its vitality and beauty of grain, and is rendered much more susceptible to the changes in the atmosphere of this climate. Experience has demonstrated that, when the tree is felled at the time the sap is down, that is, in the fall and winter, and the wood well air-seasoned, it makes the best furniture.

Well-polished walnut will compare favorably with any other wood, both in appearance and durability. Walnut, well oiled, with sculpture-carving, in appearance makes a near approach to bronze, and shows more effectively than any other wood. The old oak carvings, preserved from the destruction of ancient palaces, and other buildings of note, have become, from age, of the same color as our walnut. This fact led to the introduction of oil for finishing walnut, as the same tone produced on oak, in Europe, by extreme age, or through staining with nut-galls, considered so essential for effect in what is called by the French, "*Style Renaissance*," or revival of the old style, or in true antique furniture, *is obtained in*

walnut by simply oiling with linseed oil.

There is no doubt, that the oil finish is good for richly-carved work, where varnish or French-polish destroys the effect of sculpture. On the other hand, oil is, assuredly, a rather unsightly and unsatisfactory finish on plain furniture, and, as such, will soon run its race.

In this country, the cabinet-maker is driven to his wits' end to make furniture that will not shrink. If the wood is well varnished, it is protected from the winter's stove, furnace, and other heat; from the dry March wind, and the summer sun; and the tenacity of the glue is never impaired by the atmosphere, penetrating through the wood: from the fact, that the polish reflects the heat, the wood being, as it were, protected by a coat of glass, excluding the atmosphere. If finished in oil, the wood absorbs the heat; and the air, penetrating to the glue, destroys its tenacity. Before the introduction of oil-finish, it was a rare thing for the mouldings on first-class furniture to be falling off. But now it does not matter how dry the wood, nor how skilful the workman, the adhesive quality of the glue is destroyed; and mouldings are continually dropping off, to the annoyance of the housekeeper, and the serious detriment of the workman; though, to be sure, the mouldings can be glued, nailed, or screwed on again; and, after a while, the cabinet-maker regains his reputation, for the interim so unwittingly and undeservedly lost.

The use of walnut in the interior of dwellings is daily growing in favor. Although very beautiful, when employed in moderation and with good taste, there is danger of inordinate recourse to it, as it has a very gloomy look, particularly if oiled, as is usually done, with dark red oil, and placed in contrast with light-colored frescoing. The best finish is the natural color of the wood, toned to a *nut brown* by the material used in finishing it. The grain of the wood

should be well filled with *material on which the atmosphere will have no effect*, care being taken not to get the wood too dark, by the ignorant use of oil. A relief of polished ebony ornaments and mouldings, or gold-leaf inlaid in engraved lines, adds greatly to the effect of the wood, when kept light in color.

As walnut is used at present for doors, window-frames, and window-sashes, it

gives a gloomy appearance to our light and graceful style of interior architecture, heightened with light-papered walls and white ceilings. It looks much more appropriate with heavy wainscotings, massive groinings in panelled ceilings and dark-painted walls. Having the wood of a light color adds much to the happiness of the inmates, by increasing the cheerfulness of a room.

HERALDRY.

THE SHAPE OF THE SHIELD.

A COAT of Arms being invariably depicted upon the surface or superficies of a shield, called in heraldry, an escutcheon, it now becomes necessary to ascertain the heraldic rules concerning the proper shape and disposition of the escutcheon. Heraldry having arisen long after the classic ages, and being originally an invention rather of the camp than the cloister, assimilated that which lay immediately around. Hence the Greek and the Roman bucklers are not found here, except occasionally as charges, or perhaps in the accoutrements of supporters.

The targe or target, tarian or clasher of the Scotch Highlanders, round, small and full of metal knobs or bosses, to be managed either in the ordinary and most natural way—braced upon the left arm—by the motion of the elbow and the shoulder, or, if of the minimum size, at arm's length, in a single hand, is excluded from heraldry by its dome-like centre. For the chief material of this shield we have, in Scott's *Lady of the Lake*, sufficient authority, not near so dry as most of that we present:

"'Till fared it, then, with Roderick Dhu,
That on the ground his targe he threw—
Whose brazen studs and tough bull-hide
Had death so often turned aside."

The mere outline of this picturesque Gaelic shield, as a circular disc, is of

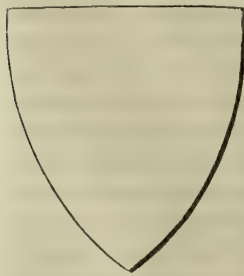
course admissible, under the rule that escutcheons, unless designed for women, may be of any external shape whatever. The shield of the present American Indian of the plains—for the aborigines of the coast did not use any—seems to have been an adaptation, by way of the south, of that portion of the armor of the early Spaniards in Mexico, under Cortez, just as they ultimately obtained the American wild horse, from the offspring of the discarded or stray steeds of the Hispanian conquerors.

George Catlin, in his "Letters and Notes on the North American Indians," Vol. I, pp. 33, 34, speaking of these cavaliers of the prairie, says: "Many of them also ride with a lance of twelve or fourteen feet in length with a blade of polished steel; and all of them (as a protection to their vital parts) with a shield or arrow-fender made of the skin of the *buffalo's neck*, which has been smoked and hardened with glue extracted from the hoofs. These shields are arrow-proof, and will glance off a rifle shot with perfect effect by being turned obliquely, which they do with great skill. This shield or arrow-fender is, in my opinion, made of similar materials, and used in the same way and for the same purpose, as was the clypeus or small shield in the Roman and Grecian cavalry. They were used, in those days,

as a means of defence on horseback only, made small and light, of bull's hide; sometimes single, sometimes double and tripled. Such was Hector's shield and those of most of the Homeric heroes of the Greek and Trojan wars. In those days, also, were darts or javelins, and lances; the same were also used by the ancient Britons; and such exactly are now in use amongst the Arabs and the North American Indians."

To this we add, that, according to Catlin's figure, and the specimens we have seen in museums, these round shields of the Western Indians are fringed on about half the circular border with depending feathers, or with scalp-locks, varying gradually from short on the two sides to long in the middle of the fringes, so that, at a little distance, the lower extreme outline of such a shield is oval. We will also add, that the shield of the Bedouin Arab is small, flat, and circular.

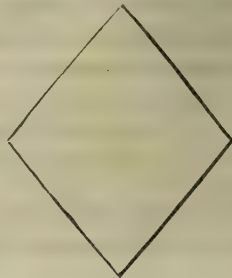
Apart from body armor of various kinds, which it both preceded and succeeded, the favorite and most prevalent personal defence of the middle ages was the heater shield, so called from its very close resemblance to the heater of the domestic flat-iron. An equally exact resemblance to its external lines is found in the arch-head of a gothic lancet window when turned upside down. This form, with its variations, to be exhibited



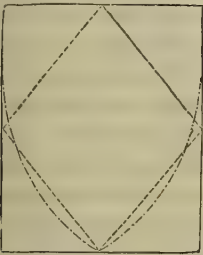
hereafter, is very agreeable to the eye, though not fully adapted to all the figures of the art of blazoning. As the shield of heraldry represents the tilting-shield, and is always supposed to be placed upon the wearer's breast, depending from his neck, thus leaving both hands free, the left to manage the horse, and the right the lance, it follows, that the ordinary right and left hand are here reversed, the heraldic right being the

common left, the armorial left being the usual right. In the course of time, fashion, if not improvement, made inroads upon the established order of things: and, while the general outline of the shield became square, a cut was taken out, either near the right or left upper corner, wherein was inserted the grip of the tilting-spear, the vamplate resting against the surrounding surface of the shield, thus enabling the knight, through the momentum of his charger, either to inflict or to sustain a severer blow. This form, however, though occasionally found in sculpture, and often in heraldic books for the sake of variety, never was generally popular, perhaps because it referred to the wants of an exclusive class; and the other belonged alike to all, who, not merely technically but literally, bore arms. Amid all the adventitious distinctions of society—monarch or subject, baron or vassal, gentleman or vulgarian—the most exalted, the most gratifying praise of another that any one can offer is emphatically to exclaim, "He is a man!" So, it is a noticeable fact, throughout all history, that neither supreme ruler nor head general ever had more desirable or more agreeable praise, than the emphatic exclamation, "He is a soldier!" From the same influence the service-shield of the soldier is the heraldic-shield of nobles and of kings.

The pattern of escutcheon exclusively appointed for all women—save queens regnant, who, from their masculine office and responsibility, are provided with the manly shield—and whose outline, even when most ornamental, is very closely confined to its lines and angles, is the lozenge, or, in the nomenclature of the nursery, the sitting-room and the boudoir, the diamond. There are very few symbols, as well as very few



words, without more than one signification, both or all, equally appropriate. What of the recondite, or the esoteric, is, to the comprehensive student, involved here, we will not pause to discuss; but, adopting the language of the ladies, would remark, in passing, that surely a diamond must be a proper field for containing the heraldic symbols of the fair and brilliant sex. As crests are the supposed ornaments of helmets, no woman, but a sovereign, is by armorists allowed to display a crest over her coat of arms, or upon her carriage, although she can transmit the paternal crest to her male descendants. This is as if the blood of the race were a subterranean river, sinking within the earth for a while, to re-appear upon its surface, with intensified clearness and undiminished volume. Both the heater and the lozenge are conformed in the position of their points to the oblong square or parallelogram, thus: the lower half of the heater corresponding very nearly with the same portion of the lozenge. Or,



if we suppose the arms to be painted upon the parallelogram, and these other two forms to be transparent screens, or diaphragms, laid upon it, then

the arms would be limned upon the heater, or the lozenge, precisely as they appear through, from the parallelogram. There is an allowance to make on the lozenge in the case of figures occupying the upper portion, or chief of the escutcheon, it being both usual and proper to depress their lower boundaries considerably below the point they occupy by rule in either a heater, or a rectangular shield. Borders also, both in heaters, or other curved shields, and lozenges, manifestly conform to the outlines of their particular escutcheons. The Italians in their blazoning always use an oval shield, mostly the great

polar section of a prolate spheroid, of which the nearest very popular exemplar is a well-shaped egg, although sometimes they use the same section of an oblate spheroid, best popularized by a plump turnip.

All these and other usual forms will be given in our next paper.

In ordinary inexpensive drawings, or engravings, heraldic shields are depicted as if flat. If more time or expense can be devoted to them, they are brought up into more or less convex relief. The light is taken as in architectural drawings, from the upper left hand corner at an angle of forty-five degrees. As seen above, the almost invariable material of shields for use was and is heavy leather, variously prepared. Sometimes the leather was stretched over a light frame of wood. Thin metal strengthened by arching, or by corrugating the shield itself, and by thicker metal borders, appeared occasionally, as dress-swords now, oftener for display on parade than use. Almost universally there was

"Nothing like leather."

As the shield was leather, there was nothing easier than to cut the ordinaries and charges out of leather also, and thus give additional prominence to the bearings or figures upon the shield, by relief, as well as by color. The old heralds speak of the ordinaries as derived from strips or bands of bright-colored cloth, sewed upon the habits of the retainers of the knights, who designed jousting at any "passage of arms;" and forming thus a livery, or, more honorably, perhaps, an uniform, which practice, from showing personality of adherence on coats, was finally extended to shields, the follower adopting the warlike distinction of the leader—hence the title, "coats-of-arms." If sculptured on halls or monuments, escutcheons are generally made very bold; and the figures, or, armorially speaking, charges must be superimposed in *alto relievo*. And, as the tinctures, which would be

accidental in most other sciences or arts, are essential in armory, and as, according to the old view* of the classic prac-

* Later researches prove, that the Greeks and the Romans *painted* their imitations of the human figure, both statues and reliefs. The old belief—our present practice—is better, but such is the fact.

tice, chasteness requires all statuary or sculpture, to remain of the color of its material, and these therefore cannot be tinted—the colors are to be expressed by arbitrary but appropriate dots and lines, in a manner we will describe on a future page.

PRACTICAL CARPENTRY AND JOINERY.

IN architecture, PRACTICAL CARPENTRY embraces that portion of the work upon a building, or other structure, performed by a CARPENTER, in the course of preparation, erection and construction, namely: the getting out and setting home of piles, and all other timbers used in foundations; the centres to arches and vaults, girders, joists, sleepers, and planking, lintels and hand-timbers, wall-plates and rafters, naked flooring, roofing, partitioning, furring walls, and ribbing ceilings to form vaulting, commonly called cradling, which applies to any form of vault, and its preparation for lath and plaster.

JOINERY is of much more accurate nature; and requires greatly finer and better-fitting workmanship than CARPENTRY. Joinery demands workmen well skilled in a number of points; as the stuff must be very accurately planed and squared, then the work be marked or laid out geometrically, so that the various joints—whether dove-tails, tenons, halplings, mitres, or whatever else the nature of the job may require—come together with the utmost nicety; and, to crown all, the surface must be perfectly smooth. All the internal and external finishing, of those portions of any building constructed of wood, belongs to this branch. Its work is, therefore, always near the eye; and must bear close inspection.

Of late years, it has become so much the custom to use hard wood, in the interior finish and decoration of edifices,

that joinery is almost separated thereby, into two distinct branches. The workman in hard woods, well-trained and grown skilful, will far excel both the carpenter and the ordinary joiner, in producing a mechanical piece of workmanship, and will be able to accomplish any particular task, within a much shorter time than either of the former could, if not skilled far beyond the mere requirements of his own art. It is, consequently, the interest of the projector, always to employ those practically skilled in the particular arts they profess to follow. Let him take then the carpenter, for the good heavy, solid and reliable work needed in the construction of a building; the joiner for the light, smooth, accurate and ornamental interior and exterior finishing; and the stair-hand, or the ship-joiner—the latter, also, one of the most exact and exacting of workmen—for all the intricate curves and ornate niceties of embellishing in wood of all kinds; and, by all means, let him employ either of the latter two, for producing the utmost despatch, finish and effect, in hand-ralls, wainscoting, and so forth.

Much of the former mere drudgery, or unimaginative work, of the carpenter and the joiner, is now performed by steam machinery, in what are usually called carpenters' mills. We refer to mouldings simple and complex, brackets, etc., produced with amazing rapidity, and in endless varieties. In fact, the machinery, for this class of work, is now so

perfect, that any form can be wrought, from a straight line, through arc, semi-circle and circle, to the more artistic curves of the ellipse, the parabola and the hyperbola—from the quarter-round and the cavetto, the cyma-recta and the cyma-reversa, to the true Grecian ovolo; and all the resulting combinations.

As for window-sashes, they have been made by machinery for so many years, that a joiner at the present day would scarcely understand the art of working them. Doors, window-shutters, and outside and inside Venetian blinds have also fallen within the province of machine-work.

The above remarks, about machine-prepared material for the joiner, do not apply to hard wood, particularly when the joinery is to be of a superior quality and style. In this case it must be done by hand. No matter how artistic the workman who designs the patterns for, or in the machine; no matter how fine the forms that may be produced by the management of a skilled artisan, yet the bulk of the products must be made by unskilled labor, and while greater general regularity of parts is obtained, the result always exhibits the set limits of the machine itself, and the absence of human mind in the direct formation. Into that work, of whatever nature designed to be artistic, the very will and soul of man must enter, and it only can enter through its being fashioned immediately under man's own eyes, by man's own hands. Then, if the mental gifts at all correspond with the will, the result is a production, which must always be looked upon by all observers, however the passing mode may incline, with sympathetic satisfaction and delight.

In fact, the employment of machinery, in the preparation of partly finished work for the joiner, arose from necessity. The rapid growth of our villages, towns and cities—and the consequent dispersion of taste through the country, whence had previously proceeded the

wealth allowing the great centres leisure for cultivating the taste, while an equal share of wealth accumulated amongst the yeomanry—so increased the demand for moderately embellished homes, that, without extraneous assistance, all the mechanics in the nation would have been inadequate to put up and finish them. Hence machinery is called into existence and into action, as the horse-reaper and the steam-reaper have been applied to the culture of the soil; and the sewing-machine has superseded pretty much all but the artistic use of needle and thread; leaving husbandmen and women, however, still enough to do, if they want to do it, although with every invention in and multiplication of machinery, the human souls thereby released, or relieved, should constantly engage in labor of lighter nature and higher grade; and none can permanently escape the strict fulfilment of human destiny, in earning the bread by the sweat of the brow.

It is now our opportunity to introduce a *full plate of details* on

PRACTICAL CARPENTRY

AND

JOINERY.

This we purpose continuing in every number, embodying interior and exterior examples, from the simplest to the most elaborate, with hints for preparing hard wood, and introducing the various kinds of it into the frames, panels, and mouldings of the same piece of work, so that their differences in graining and in color may blend harmoniously, and produce the desired effect.

The accompanying plate represents

A WINDOW

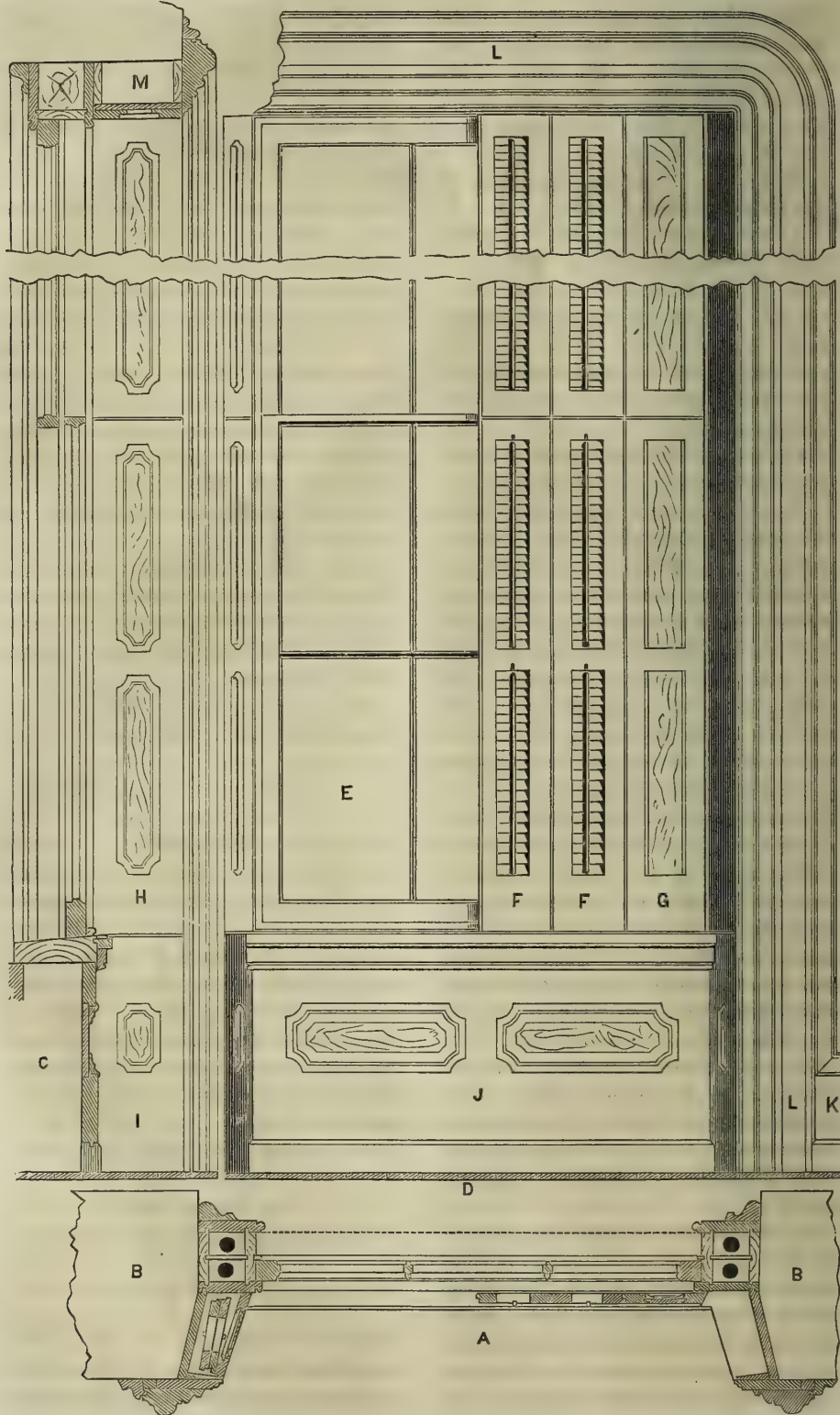
WITH INSIDE SHUTTERS,

AND

VENETIAN BLINDS,

WITH THE FINISH WITHIN THE ROOM.

A is the plan, showing a section of the architrave, the soffit to receive the shut-



ters, the sash with weights, &c. B B are the walls. C is the section through the wall, the sash and the head, showing the sill of the window-frame and a portion of the sub-sill. D, the elevation of the window, with one-half of the shutters closed. Two of the shutter-flaps are Venetian pivot-blinds, and the jamb-shutter is paneled and moulded, while all are cut at the meeting-rails of the sash. E the sash. F F the blinds, as last referred to. G the jamb-shutter. H, the same, when shut within the soffit. I, the face of the elbow below the shutters. J the panel-back below the sill, with the sub of the washboard along the floor. K the face of the washboard, with sub and moulding on the top, as they connect and member with the architrave, and form part of the same. L L the architrave, as continued round the window, with circular corners, in place of the mitred angles commonly used. The quadrant is cut from a circle, turned in

a lathe to the exact transverse-sectional form of the architrave-frame, from which *three* of these corner-pieces can readily be cut. Where many of the same kind are to make, this is practical economy; although, should the joiner choose to glue four separate pieces of wood, square in cross-section, together, with paper in the glue-joints, to form his corner blocks, and get the turner to centre the blocks very truly, he will, of course, have *four* corner-pieces from each block already fitted. In either case, this method makes a butt-joint, which is less liable to shrink than a mitre. As a compensative, however, the style, through rounding the angles, is rendered feminine; true masculine boldness of finish in this particular abiding only in the mitre-joint.

To return to and finish our figure, almost lost to view in this digression. M is a transverse section of the head and the architrave conjoined.

PLUMBING.

BY WILLIAM G. RHOADS.*

AMONG the many conveniences and luxuries, which have of late years been introduced into dwellings, perhaps there are none more important, than those for insuring a well-arranged and thorough SUPPLY OF WATER; and few to which so small a part of the attention of architects has been directed.

When a beautiful book-case, or centre-table, has been designed, or a column modelled, in exquisite proportions, it stands fixed in its place; and is scarcely liable to damage or accident. Respecting either, we are not compelled to consider the EFFECT OF MOTION; but in WATER SUPPLY AND DRAINAGE, this is an element of the first importance. Every part is worn, more or less, by use; and the result of defective or injured parts is often to damage walls, ceilings and carpets handsomely decorated. This is

not necessary. The plumbing in a house can be done in such a way, as to avoid any probable accident; and to this subject, the attention of architects and others is called. In a subsequent article, we hope to refer to the proper arrangement of water-pipes in buildings, for protection from frost; prevention of the danger from expansion and contraction in hot-water pipes; security against damage from leaks; and adaptability to facile repairing.

The earliest mode of water-supply was to have water-pots of stone, or other material, standing in some convenient place; and these were kept full by the members of a family, or the servants, carrying water, from springs or wells, in buckets, or water-bags. The water was taken from wells, either by buckets, or by cutting away one side of the well,

* McCollin & Rhoads. Plumbers and Steam Fitters, No. 1221 Market street, Philadelphia.

and thus making a path down to the water. In more recent times, we have the windlass, the spiral tube, the well-sweep, the wooden pump, the iron pump, the horse-power pump, the windmill, and the air-engine; and, for streams, the water-lever, the hydraulic ram, the water-wheel, &c. These bring us to the sources of water-supply for country residences, of which we will speak in another paper. The importance of a full supply of good water can scarcely be overrated; and there are few, if any, country houses, where it may not be obtained, by some device or other. The questions, of the distribution of hot and cold water through the house, and the carrying off of waste water, are there much the same, as in city houses. What was not known a few years ago, even as a luxury, is now a necessity. When a hydrant near a door, from which all the water had to be carried in buckets, was esteemed the most convenient arrangement that could be put in, our predecessors had little idea of the present conveniences. The first addition to the hydrant in the yard was a kitchen sink, with a waste-pipe in it, so that the water could flow away, without being carried and thrown into the street. This had only a cold-water supply. A great advance was the heating of water by the waste heat of a range, through a "log" boiler, placed back of the range, where the smoke and hot gases pass into the chimney. This is now rapidly falling into disuse; and the circulating boiler and water-back, producing an abundant supply of hot water, is taking its place; an additional cock, connecting with this boiler, supplying the sink with hot water.

The bath-tub and the shower were next added. First, a simple wooden box and shower, with punched holes; now the polished metal tub and tubular shower, with silver, marble, and walnut setting, are esteemed necessary for comfort, in very moderate houses. To the water-closet, cleansed by a flow of water, were soon added the urinal and

the foot-bath; and that great luxury, the bidet, is only now beginning fully to assert its claims to general use, as those who have tried it esteem it a necessity.

The plan of movable pitcher and basin, with attendant slop-bucket for chamber service, is giving way to the superior claims of permanent wash-basins with marble tops, and cold and hot-water supply and waste-pipes. To this is now added a walnut, or other ornamental bureau and a mirror, making in combination, a piece of furniture of great beauty. Fountains and small ponds for beautifying gardens and conservatories,—and jets and vases for libraries,—are among the luxuries gradually finding favor amid the wealthy.

Nor is the kitchen forgotten. The round wash-tubs with the necessary annoyances of heavy lifting, sloppy floors, movable washing-benches, &c., are passing away; and the permanent wash-trays of soapstone, with supply and waste, are taking their place, while combined with these is the copper clothes-boiler, set in its small adjacent furnace, so that washing has now become a comparatively comfortable and easy operation.

In a recent search for a small dwelling-house, the writer had occasion to examine twenty or more tenements, and in that number, so little attention had been paid to the convenience of the bath-room, both in its arrangement and location, that in one house only was there any approach to it, except through a sitting-room, dining-room, or chamber; and, in many of these houses, the bath-room, being in a frame projection from the main building, could not be used in winter, because the pipes froze and burst. It is our intention to illustrate by suitable designs, the *MODEL PLUMBING ARRANGEMENTS FOR DWELLINGS, STORES, COUNTRY RESIDENCES AND FARMS*; and to call attention to the various defects and difficulties attending the common mode of fitting houses with *WATER SUPPLY*.

Fresco-PAINTING.

BY CHARLES BREMER.*

Fresco-PAINTING, as an art, with its especial appliance to the ornamentation of both public and private buildings, dates back its existence to the most remote periods of the history of the world. It was known and applied to the decoration of temples and other public buildings in India, long before the Egyptian era of art and architecture.

It would be very difficult, at this remote point of time, to determine when, where and how, it first came into existence; or how it gradually developed itself, until it became, not only an acknowledged, but a highly honored art, among the ancients.

The first period of this art appears to have been grotesque and ornamental, at one and the same time. Traces of this are still extant, among the various pagodas and other buildings of ancient India.

The Egyptians come next. They seem to have applied this art, more with a view of perpetuating the history and memory of the dead, than for the embellishment of their temples, palaces, or houses.

Neither in India, nor in Egypt, was this beautiful art ever fully appreciated, or understood; and, had it stopped in its progress then, we should, in all probability, have known little or nothing more about it.

It was during the Grecian period of the world's history, that fresco-painting first assumed its proper place with an art-loving people. During the existence of the Greeks as a nation, the arts of every description flourished to a wonderful extent. Sculpture, painting, and architecture were developed, to a degree entirely unknown and undreamed of before; and the first and third to a

height scarcely equalled and certainly never out-soared since; and it is to this people's keen scrutiny of nature, their innate love of the beautiful and carefully cultivated taste, that we are indebted, for the more perfect development of the art of fresco-painting.

The Romans fully appreciated this art; and, although their works did not always reach the same high standard of merit with those of the Greeks, they, nevertheless, succeeded in producing some very fine specimens of the art, many of which are still in existence.

In Roman fresco, we have those two unerring witnesses—the buried cities of the flanks of Vesuvius, Herculaneum, and Pompeii, tritely quoted but ever fresh, whose walls exhibit in good preservation, well-drawn human figures, flowers and foliated scroll-work, in addition to the precise geometrical patterns we might expect to see; and it is well to remember, that these were provincial cities. Could the same catastrophe have occurred to the Rome of that period, we should have a very different and far higher estimate of the proficiency of the ancients in the various arts of beauty, and of their uncited and lost discoveries in the arts of use. We constantly, and very properly discount Roman art, when Grecian is made the test; but must bear in mind that as Greece was conquered by Rome, the chief master-pieces of the Hellenic artists must have been within her palaces. In those smaller and choicer specimens, which have come down to us, such as lamps, vases, and engraved gems, we find little to criticize; and though arts are known to have flourished unequally at a number of periods, yet the exquisite management of design in gems would

* *Fresco-Painter*, No. 152 South Fourth street, Philadelphia.

have a very important effect upon the laying out of frescos.

It is not in the delicacy, the perfection, or the intuitively graceful feeling, of outline presenting detached objects, that the moderns can expect to surpass the ancients. But the latter times far exceed the former in contrasting and in harmonizing the lines and tints of ornamental painting in grouping the subjects under treatment, not only where human figures are concerned, but also in still life; in linear and in aerial perspective, and, finally, in general effect. In like manner, the ancients were acquainted with music, as far as respects melody, the distinctive term for the *air*, or that part of a musical composition which everybody hums, and in which all the voices and the instruments are either in unison or else pitched with intervals of an octave, always most agreeable to the uneducated musical sense; but very insignificant was their knowledge of harmony, or the agreement, derived from thorough-bass, or counterpoint, of a number of melodies, in intimate relationship to and with each other, all of which, separately, are agreeable to the ear; all of which are heard and enjoyed separately, and yet all are so arranged, as to musical intervals, that their combined effects, while not drowning the air, are far richer than the finest solo, whether bass, barytone, tenor, alto, or treble, ever sung or played.

Throughout the Christian era, fresco-painting has flourished beyond all precedents; the master hands of Michael Angelo, Raphael, the Fra Bartolomeo, Domenichino, and others, having raised it to the highest level as an art.

There are three different modes of frescoing:—

The first and earliest: Consists in the application of the colors to the fresh or wet plastering, the artist almost immediately following the plasterer. In this method, the pigments strike directly through, and become most absolutely incorporated with the entire body of the

plaster. This would seem to be the very perfection of such an art, as the picture, so far from existing merely as a surface film, will be constantly the same, on regularly abrading and resmoothing the face of the plaster, till no more of the latter shall be left. Accordingly, we find, in the European palaces and cathedrals, that while, in frescos executed two centuries ago, pieces of the ceiling flake off, and drop to the pavement, or the floor, these layers are not paint on one side and lime on the other, but always of a homogeneous color; and, what is much more important, that the pictures themselves remain fresh and perfect as ever, except that, in certain points of view, the edges of resulting shallow concavities of surface display certain lights, or shades, or shadows, certainly not intended by the artist, and decidedly out of place, yet, after all, at the distance whence they must be viewed, not inharmonious; whereas, were the colors not an integral portion of the plaster, the intelligent reader well understands, that these flakings would leave white spots, and the pictures would soon become the most melancholy wrecks. There is, however, one most serious abatement from the absolute perfection of this method. No care, skill, or art can hide the slight variations in tone, produced by the contact of the portions of the surface corresponding with the several or many days' labors of the plasterer and the artist. There they always are, irking the producers during their own lives, and ever annoying the considerate artists and connoisseurs who come after, sometimes even being quite perceptible to the uneducated or inartistic eye. This inseparable drawback from the perfect beauty of the greater works in wet fresco, would seem to prove, that the acme of this style can only be expected in such sized panels as the artist is certain of beginning and finishing within a single day. It must be allowed, that a mere chance leak—if immediately attended to, so that the whole body of the plaster

would not drop away—could have little more effect upon the picture than the daily joints in the plaster. Practically, however, as the larger work upon ceilings and domes must be far removed from the eye, we could well pardon the necessary concomitant defect, for the sake of the great and grand conceptions of the master painter, who himself—as great cartoons of this style demand great space—would find it impossible to squeeze them into the narrow bounds of a mere medallion panel. But great pictures of this kind will always be few, because they are enormously expensive.

The second mode, also mainly practised upon ceilings, is: To use water-colors mixed with, what is technically called, by the artists of this branch, “fresco,” the ingredients and proportions of whose composition, though mainly the same, vary with each practitioner, and whose principles are kept secret by the members of the profession, upon dry sized plaster, with the surface of which it thoroughly incorporates, so that the picture must last while the surface endures. This is the present prevalent method, safe, easy, expeditious and comparatively inexpensive. As the picture cannot however be washed with impunity, it will hardly answer to paint it upon the walls of an edifice, much less upon those of a dwelling. It will not, however, disappear, or blur, with dry rubbing, so that household dusting, for the sake of cleanliness, is perfectly safe.

This brings us to the third mode: Painting in oil-colors, upon plaster properly prepared. The effects, derived from this third method, never begin to equal those produced by the second, much less those obtained through the first—the true brilliancy of the colors being sacrificed for the vehicle; but the picture withstands most evil influences, as long as the plaster remains unbroken; and, what is of great importance to the house-keeper, the work can be washed, after once fairly setting, with water and soap. In practice, then, water-fresco is the

style for ceilings, and oil-fresco that for walls.

Fresco-painting, as a means of embellishing churches and public buildings, has been known to the American public for many years; but its application for the purpose of decorating private dwellings is of very recent date. The advantages of this over the former method of adornment, by means of tapestry and wall-paper, are almost too numerous to mention in this short article. We will call attention to a few of the most important.

1st. Unlike wall-paper, it is perfectly healthy, not being subject to chemical reaction.

2d. It is perfectly free from smell in wet or damp weather.

3d. It is not liable to change color, by exposure to either light or darkness; and heat and cold will not in the least affect it.

4th. It can be washed, without being in any way exposed to injury.

5th. Houses decorated in this manner are invariably free from those pestiferous insects, that perpetually infest dwellings covered with wall paper.

6th. Individuals have it in their power to suggest, or control, the designs and style of execution, thus making an original range of ornamentation possible for every house.

Much more might be said in reference to its durability and consequent cheapness; and its natural tendency to preserve the walls in their original beauty of surface, a fact of which the ruins of Pompeii and Herculaneum, and the remains of many other places, furnish the most ample proof. Indeed, some of our own churches and other public buildings, many of which were decorated in fresco more than thirty years ago, and whose walls yet stand, in all their original freshness, will demonstrate clearly, to every thinking mind, the great superiority of fresco-painting over all other methods of decoration, in houses of every description.

WEST PHILADELPHIA.

BY HENRY M. BOYD.*

AMBITIOUS enterprise is achieving great results in West Philadelphia. Land, that was very lately occupied by pasture and cornfields, is now teeming with the busy industry of hundreds of mechanics; and dwellings of superior size and style are rising up, as if by enchantment. The building of the Chestnut street bridge brought all the land west of the Schuylkill, between Arch and Spruce streets, for several miles back, into immediate availability; and that large extent of unimproved property rapidly enhanced in value. Sagacious builders recognizing the fact, that property on the line of the Chestnut and Walnut street Passenger Railway, west of the Schuylkill, is nearer the business centres of our city, than any other, north of Green street, have inaugurated an immense improvement, by building one hundred and thirty-six elegant dwellings, twenty-seven of them at Thirty-fourth and Chestnut, now about being roofed in, and costing from \$12,000 to \$18,000 each. Seventy-six of them, on Sansom street, between Thirty-second and Thirty-third streets, now in process of erection, with brown stone fronts and French roofs, containing ten rooms and every modern convenience; and thirty-three first-class, large houses to be built, on the south side of Chestnut street between Thirty-second and Thirty-third streets, of which a cut of the plan adopted by the writer and builder will appear in the third number of this book. All these improvements will vie with any in Philadelphia, for style of architecture, beauty of design, and excellence of finish. The streets in West Philadelphia are kept of a greater width than any east of the Schuylkill. Chestnut street is one hundred feet wide,

and the other streets are not less than sixty feet wide. In a very short time, these improvements will be finished, and the streets handsomely ornamented with fine shade-trees, offering a place of residence not inferior to any in our city. The location is high and healthy, as the grade rises rapidly all the way from the Schuylkill to Thirty-ninth street, forming excellent drainage, a matter of first importance. Large sewers are now being constructed through the streets, adjacent to these improvements. The soil is a deep bed of gravel, insuring dry cellars and firm foundations. The Chestnut and Walnut street Passenger Railway runs cars every three minutes past the property, while the Pennsylvania Central, New York, Baltimore, West Chester and Media, and Reading railroad depots are very convenient. In fact, West Philadelphia is not a remote suburb; but really is immediately in the city, within the influence of every throb, arising from the pulsation of its business centre.

The Schuylkill river front is assuming vast importance. Wharves are being built and occupied for merchandise and material of every kind. Coal, oil, lumber and stone are demanding the attention of capitalists. Full-rigged vessels, with their masts touching the parapets of the south side of Chestnut street bridge, may be seen loading and unloading every day. The scene presented, looking south from the bridge, must convince the reflecting mind, that an immense business is rapidly centring there; and, looking from the crowded east side, the observer's eye will rest upon the now comparatively vacant west bank; and he will find himself unconsciously—wonderingly—reasoning, why

* Builder, No. 146 South Fourth street, Philadelphia.

that was not built up long ago, and before the northwest and northeast sections of our city. It is easily answered. We could not get across; we needed a bridge; and, now, that this one is built, look at the result. Brooklyn, with her ferry-boats, has grown to be a magnificent city, but to West Philadelphia, with her bridges, she will be but Lilliputian.

West Philadelphia has a great and glorious future. In a very few years, her river front will be lined with stores and warehouses.* The concentrating of the great railroads of this country in her midst; the building by the Pennsylvania R. R. of the mammoth wharf one mile in length, must neces-

sarily attract a large number of wealthy merchants, and a concourse of other business men. All these people, with their families, must seek a convenient home. Houses, from this time forward, will be built by hundreds; and the most delightful part of our city will be West Philadelphia.

Mr. John Rice, the eminent builder of this city, in purchasing the large tract of ground upon which the present improvements are now being made, has displayed his well-known sagacity as a real estate operator and a far-seeing man, leading in a gigantic enterprise; benefiting the public, and far eclipsing his timid contemporaries, while giving them heart and courage to follow in the wake of a leader, whose enterprise and judgment is unquestioned, and whose uninterrupted success is a sure guarantee of well-ripened experience and successful management, in undertakings at once judicious and bold.

* With due deference to the feelings of our correspondent, we hope not. There is plenty of room in the Neck, for stores and warehouses; in fact, considerably more space than the whole solidly built portion of Philadelphia now occupies. What we hope to see, is the whole river front of West Philadelphia occupied with lawns and groves as part of the great Park.—Eos.

STAINED GLASS.

BY JOHN GIBSON.*

FOLLOWING up the remarks made in a former communication, we will now endeavor to explain the cause of the decline of the art of producing, in stained windows, the sublime effects of the ancient masters; or, at least, the known decline of the effect, and the supposed decline of the art, in the hands of the artists in glass during the seventeenth and eighteenth centuries, and part of the nineteenth. As was said before, much of the sparkling brilliancy has been added by the aid of time, and the imperfect manufacture of the glass itself, as compared with the mode of production of the later centuries.

The old masters in glass were not only painters but chemists, who made

their own glass in small crucibles, mixing their colors in them, and not blowing the contents out into large cylinders, as at the present day; but casting them in pieces, rude and rough on the surface, not making their panes larger than from four to six inches square, and these so very irregular in thickness and so imperfectly mixed, that you will find in the same piece a variety of shades and many streaks, all of which plainly shows that they either had not the power or the science—or possessing both had not the desire—to manufacture it smooth and fine as at the present day. Not unlikely the seemingly defective irregularity was the proper result of deep design, as this, so far from detracting from the

* J. & G. H. Gibson, Stained Glass Manufacturers, No. 125 South Eleventh street, Philadelphia.

beauty of the whole, when worked up into a pattern, and adjusted in its place, adds greatly to it. Thus nature puts on her grassy mantle, apparently of one uniform brilliant green; yet the artist's eye discovers the variety of tones and shades, so softly and nicely blended, giving a choicer beauty to the landscape. So, that even a simple green field, as painted by nature, has enough variety not to be monotonous. This, in fact, has much to do with the beauty of the ancient glass, worked in mosaic pattern, giving it that kaleidoscopic effect, so much more pleasing, than that obtained when you take the glass of the present day. This latter is so well manufactured, that its color, though equally beautiful in itself, has, in comparison with the antique, a flat, cheap look, even when made up into the same mosaic forms; and the modern artist has to resort to shadings and blendings with enamels on the surface of the glass, to produce the mediæval effect. This, of course, destroys a portion of the brilliancy and transparency of modern stained glass.

We refer, here, more particularly, to the earlier productions, before the introduction of figures, symbols and heraldic devices, which, by requiring a different sub-division or arrangement of lines, gave greater variety to the pattern.

There is one other point, which it may not be out of place to notice here: that is, the care the early glass-workers took, to have their patterns and designs in harmony with the architectural style of the building. In the grand cathedrals and churches of earlier times, this seems to have been especially the case; as if the architect, the mason, and the sculptor, the glass-stainer, and the decorator, all had one feeling towards producing a grand result; each artist not executing what might be beautiful in itself, but what would be in keeping and harmony with the whole when finished.

Ruskin attributes a great deal of this, to the fact, that the monks of old would

devote their time and talents to this and other branches, connected with church building, without compensation, and for the glory of God. This may be so, although we have many old statements of what the "auntient glasse" cost per foot; but there is no doubt that the ancient artists in glass-painting were part of that noble band of Free-masons, who were employed in building and repairing cathedrals, churches, and other great edifices in England and on the continent; and who travelled from place to place to execute their works. This will account, in some measure, for the palpably congenial spirit, in carrying out their designs to harmonize with those of their allied brothers, engaged in architecture, and also for the similarity or adherence to style of the older masters.

Thus we find, that in the Norman window head, which is semi-circular in architecture, the glass tracery and the leaden bands were formed in circles, half circles, ovals, lozenges,* &c. These being enclosed with a rich border composed of small pieces of all colors, including a neutral tint, approaching to white, gave the effect of brilliants and other gems, set in silver and gold. Not even gold itself is so luminous as the glorious golden yellow of stained glass, when kept in proper subjection to the other colors; and it must not be forgotten, that the black bands of lead which join together each separate color of these minute pieces, add greatly to the richness of effect, when relieved by the heavy frame of massive stone-wall which surrounds it.

This style prevailed during the eleventh and twelfth centuries, intermixed, as before stated, with medallions, figures, symbols, &c., illustrative of Christian history, or traditions from the lives of saints and early martyrs, some of which are very curious, and may be dilated upon in future communications.

* That is, rhombs or diamonds.

An antiquary in speaking of specimens of this period he had seen, says: "So brilliant are these windows, that it would seem, in fact, as though the artist had dipped his pencil in turn, in a solution of amethyst, topaz, ruby, grenate* and emerald." What a sense of magnificence and grandeur this conveys to the mind; but, in truth, not more than the reality. If the reader has ever been in one of those grand old churches—where the only light admitted is through the gorgeous colors of the windows—he must have felt the exhilarating effect produced by gazing upon them, and observing the rich and variegated streams of colored light upon the architecture, when the sun shines through, and gives splendor to the colors. If so, he will appreciate, to the uttermost, the following quotation from "Aubrey's Anecdotes." In speaking of stained glass, our author says: "The curious oriental reds, blews and greens in glasse painting, especially when the sun shines, doe much refresh the spirits of a poor, distracted gentleman, for whereas his former physician shutt up his windows, and kept him in darkness, he did open his window-lids and let in the light, and filled his windows with glasses of curious tinctures, which the distempered person would always be looking on; and it did conduce to the quieting of his disturbed spirits." This is quaint, but true; and, contrariwise, when the sun has gone down, and "'tween the gloaming and the mirk," the windows only half light up the noble groined arches and the massive columns, giving a misty airiness to the vaulted roof, illuminated in the deepest of azure and gold, or enriched with grand old frescos—you feel the soul-subduing, though not depressing effect; and wonder not, that, in the dark ages, the ignorant should look with awe upon the works of man, as if they were of God.

During the thirteenth century, a similar style prevailed with an admixture of "free-scroll," semi-foliated ornamentation, and the introduction in some churches of the representations of kings, dukes, counts and barons, armed from head to foot, and mounted on horses, richly caparisoned, in addition to the heraldic devices and shields of the same. These effigies were probably representative of benefactors, or donors to the church; just as in the present day, we put up memorial windows in our churches in recognition of those who have been eminent for their piety, or have given of their means, as God has blessed them, for the support of the church.

In the fourteenth century was developed another style, called the decorated; but, as to describe the various differences of the successive periods, would occupy too much space and time for this article, I will merely mention the different centuries, in order to arrive at the point when the art was said to decline and be lost, leaving to the future a more elaborate notice of the different periods.

The fifteenth century was distinguished particularly by the perpendicular or florid gothic, and, of course, the glass partook of the same character, as did also the application of the stained glass to the decoration of palatial and other residences, it being principally of a heraldic character, and a style of ornamentation partaking of the Italian and Elizabethan characteristics.

In the sixteenth and succeeding centuries, church architecture began to lose the former grandeur of conception, became debased in style, and may be said to have declined. Consequently its accessories may be held to have declined along with it, as the artists commenced to treat the glass in a different manner, making it look as much like pictures or paintings in oil on canvas as possible, thereby losing the effect of the old windows, falling into what has been denominated by a connoisseur friend of ours as

* For "precious garnet" or "almandine," of a much deeper, but far heavier and grosser red than ruby.

the "washed style," and thence losing the proper feeling, which conformed the glass to the architecture. And although great artists, as in the case of Albert Durer,* did design for glass-stainers, they had not grasped the idea of the old masters, that the stained-glass was an integral part of the architecture, whereas they made the mullions perform the part of a frame for a picture, in looking at which, you lost sight of the mullions in great measure; as the subject generally extended through the whole window and thereby destroyed the beauty of the architecture.

In the eighteenth century, Sir Joshua Reynolds, the President of the Royal Academy of England, made the cartoons of a large window, containing the Adoration of the Shepherds, and the figures of the Cardinal Virtues, which, though faultless in a great measure as paintings, are entirely unsuited for a church window. This window, in the chapel of New College, Oxford, was painted by Jarvis, an artist in glass of good celebrity, but lacking the old knowledge, or not having the taste to follow the rules of the old masters, he failed to produce a *chef d'œuvre* in stained-glass.† Of course all

fashions change; and it was not in England alone, but in Italy, France, and other parts of the continent, and even with such artists as Raphael and Vandyke for designers, that they made pictures of windows, in place of rich designs subservient to the architecture.

Thus we see that it was not for want of eminent men as painters, that the art declined. Though not lost, it fell into abeyance, owing probably to these unquestionably great masters, thinking to establish a purer taste, comprised in more correct and finer drawing, than had been applied to windows by their ruder forefathers; but they failed to give that grandeur, which is the glory of the ancient windows.

The taste, however, for the revival of the antique style, has been slowly but surely making progress; and many fine examples have been produced, indeed examples not much inferior to those of our own ancestors in the art, whom nevertheless we should not servilely try to copy, but endeavor to find out the true principles on which they worked, and then try to surpass them.

were engraved then on framing copper-plates in stipple, by G. S. and J. G. Facius, from the drawings of John Boydell, Cheapside, London, who published this series, from 1781 to 1785; and have since appeared, on copper or steel, in at least two smaller sizes; and, as pictorial compositions, have always been favorites with the public.—[Ed.]

* Misprinted in some copies of the July number, p. 58, 2d col., *Alfred*.

† The identical designs of Sir Joshua Reynolds, however,

VENTILATION AND HEATING.

BY LEWIS W. LEEDS.*

POPULAR education, or the education of the masses, is a slow process. Until quite recently, the great fire-place, in most of our sitting-rooms, rendered all other arrangements for ventilation quite useless.

It is not surprising, therefore, that the very delicate and complicated problem: how we should ventilate our houses

thoroughly, and warm them comfortably, should not be already solved.

With many, there is a greater amount of dependence placed on mere mechanical contrivances for ventilation, than there should be. The ever-varying conditions of the atmosphere, changes of temperature, force of wind, and the differences in our own physical condi-

tions, necessitate corresponding modifications of our arrangements for ventilation and warming. We must, therefore, in the outset, make up our minds, that we shall have greatly to depend on constant individual care and intelligent thought, for the proper management of any efficient system of ventilation; and, that it is quite impossible to have an automatic arrangement, that will fully accomplish the object desired.

Of course, if you were to choose for a dwelling the centre of one of the Pyramids of Egypt, or the bottom of a mine, one thousand feet below the surface of the earth, then the troubles from the constant variations of the external atmosphere would be in a great measure overcome.

But those who find it more convenient to live in their paste-board houses, above ground, must provide the means of counteracting the inconveniences arising therefrom. This can be done easily, because, as many of our young men know, than a canvas tent with a flue passing under it—so as to keep the floor well warmed, and with the proper introduction of warmed air to supply the necessary ventilation,—no more pleasant or comfortable room need be desired, even in severe winter weather.

The thorough warming of the floor is the special point of excellence in this arrangement; and this must be carefully attended to, in all habitations, where comfort and health are desired.

There is frequently much discussion, among young students of ventilation, as to whether the breath from the lungs falls to the floor, or rises to the ceiling.

In practice, however, this is of very little importance, as there are other conditions or requirements that entirely overrule it. The great controlling principle is heat. This determines the opening or closing of all ventilating arrangements. The variations of temperature of the inflowing air, which we must assume to be the fresh air, have much more influence on the rising or falling

of the impure air, than the mere difference of its specific gravity.

For instance, we take an ordinary room in winter, wherein the temperature is maintained at 70° . Now suppose the air, by which that room is warmed, is flowing in at a temperature of 150° ; and, this, much of the time, is the only fresh air entering the room. This would rise, in three or four seconds, to the ceiling; and spread out, above all the air that had been longer in the room, whether more impure or not.

In this case, if there were an opening directly at the ceiling, all the fresh and warmed air would there directly flow out, leaving the main part of the room cold and foul. But now, suppose we open a door into an adjoining hall, the temperature of which is 40° . The cold air of the hall would at once rush into the room, at the bottom of the door, flowing under the warmed and perhaps foul air of the room, pressing it up towards the ceiling. Here, then, the fresher air would be at the bottom: or, if the external air was 25° above zero, all the fresh air coming through doors and windows would fall to the floor, more decisively still. Thus we see, that the conditions in which it would be exactly correct to have the exits, for ventilation, either at the top or bottom, are liable to be changed twenty times in a single minute.

There are other important disturbing causes, such as the combustion of gas; the very deleterious products of which rise directly to the ceiling, while very hot, but, if not taken out of the room at once, are liable to fall to the floor again, from their greater specific gravity, or are sometimes crowded down, by the warmer fresh air from the heating apparatus. Here, again, we see the great inconvenience, to say nothing of the unhealthfulness, of exclusively warming a room, by circulating warmed air.

But where the door and the exterior walls are heated, the fresh air may come in, a little cooler, than the contained air

of the room, as, falling first to the floor, it forces the foul air up, and out at the ceiling: or, when the fresh and cooler air comes in at the top—as it ought to do, when it is possible to have it so arranged—then, by having a rapid exhaustion from the floor, the foul air is removed at once, on being thrown from the lungs; and the whole room is kept filled with the pure air.

The nearer the temperature of the inflowing or fresh air is to the temperature of the room, the less difference it makes, as to the position of the escaping air, and the more diffused it may be throughout the apartment.

As before remarked, it is folly to imagine, that we shall discover some automatic ventilating machine, that will keep us supplied, at all times, with perfectly pure air. Instead of this objectless and wasteful musing, we must first carefully study the subject; and then we will learn, little by little, how to

accommodate ourselves, at all times, with pure air, without unpleasant draughts, by varying our arrangements, for the supply thereof, as we vary our clothing, according to the variations of temperature.

It certainly is to be hoped, that we shall lose no time, in applying ourselves with real earnestness, to the study of—how we can best supply ourselves—each individual for himself—with air sufficiently pure, to sustain the body in half of its full vigor, which, according to the late reports of the Board of Health, is not done in this city.* As reported, last month, over 60 per cent. of the deaths in Brooklyn, and over 50 per cent. of those in New York, were occasioned by foul air.

Is it not about time we began to wake up to the magnitude of this scourge of foul air?

* That is, New York.

THE LOS ANGELES VINEYARDS.—It is the vineyards and orange and lemon orchards that make Los Angeles the garden spot of California. Just imagine a collection of gardens, six miles square, and producing at all times of the year almost every thing that grows under the sun. One of the largest and most beautiful places in the city is the Wolfskill Vineyards, containing 2,000 orange trees, 1,000 lemon trees, 500 walnut, 100 fig, and 100 lime trees, and 55,000 grape vines. Near by is the vineyard of Mr. Childs, containing 500 orange, 100 lemon, 500 apple, 500 pear, and the same number each of peach, plum, nectarine, apricot, olive, walnut, and chestnut trees, and 10,000 vines. Right in the heart of the city is Don Mateo Keller's place, containing 100,000 grape vines, 1,000 lemon, and 500 orange, 100 lime, 100 olive, 200 walnut, and 100 fig trees, and all of the other variety of fruits known in the South and in the

semi-tropics. He also raises hops, cotton, and tobacco, wheat, barley, corn, all kinds of vegetables, and every thing of the berry tribe. Last fall Mr. Keller made 100,000 gallons of wine and nearly as much brandy. A few miles from the city a Mr. Rose has a vineyard of 200,000 grape vines. Near him is the vineyard of Colonel Kewen, containing 75,000 vines, 800 walnut, 500 orange, and 300 each of lemon and olive trees. It must be recollected that from a little elevation in the centre of this garden city may be seen the broad Pacific upon the one hand, and upon the other, two hundred miles of mountain covered with snow. No such picture can be seen upon the Mediterranean Sea.

HIRAM POWERS has completed a statue of Edward Everett, which he would have given to Boston but for the criticisms upon his statue of Webster.

MODERN FRENCH DOLLS. — George Augustus Sala says: "If you buy a doll in Paris now-a-days you must not only put her *dans ses meubles*, but furnish for her a luxurious boudoir in the Pompadour or the Empire style. She must have a carriage. She must have a saddle-horse. She must have a 'ghroom' and a 'jockey.' She must have a grand piano from Erard or Pleyel. Her gloves must come from Madame Causse, her bonnet from Jenny Navarre, her watch from Leroy, her diamonds from Mellerio. She must have seventy-two petticoats, like the Russian Countess who lives at the Hotel Bristol. She must bathe in milk of almonds, or *sang de menthe*. And I am very much afraid that, if you are suddenly called away, and return in about a fortnight, unexpectedly, you will find your doll drinking champagne with your 'ghroom.' Don't think I am talking about real men and women. I am discoursing simply about the dolls who, in the French *Bimbeloterie* Court at the Exhibition, are flirting, lounging, waltzing, jingling on the piano-forte, surveying themselves in mirrors, and ogling each other through consoles. The old child-doll type seems entirely lost. The French toymen have taken to the manufacture of adult dolls. They look like dolls that have vices—dolls that don't care much about the Seventh Commandment—dolls who, to feed their insatiable appetite, would eat you out of house and home, mortgage your lands, beggar your children, and then present you with a toy revolver to blow out your brains withal. They are so terribly symmetrical, so awfully life-like; they carry their long trains and nurse their poodles, and read their *billets doux*, and try on their gloves, and gamble at lansquenet with such dreadful perfection, that you would not be at all surprised at last to find a male doll cheating at cards, or a female doll running a long milliner's bill and forgetting to pay it. And this is the chief count of my indict-

ment against the modern French dolls in the Exhibition. They have nothing to do with the happy, innocent, ignorant time of childhood. They look like dolls who know the time of day."

In this matter the present American fashion of giving dolls the appearance of children, varying from babyhood to about five years of age, is natural and therefore proper. All little children prefer and instinctively choose them for their own use. This modern French idea is a reversal of the order of nature, as the infants, who can get no other style, are compelled to nurse the adults.
Eds.

RESPIRATION OF ANIMALS.—M. Reiset, in a memoir to the French Academy of Sciences, gives an account of his experiments on the exhalations of calves, sheep, etc. The apparatus used by him was large enough to enclose the whole animal. Under normal conditions he found, during the respiration of calves and sheep, that carburetted hydrogen was given off in considerable quantity; but this was not the case when calves were fed upon milk. M. Reiset regards carburetted hydrogen as the result of incomplete combustion, and draws the general conclusion that the respiratory products depend much more upon the nature of the food than upon the species of the animal.

INTERNAL HEAT OF THE EARTH.—An artesian boring near Geneva, Switzerland, to the depth of 742 feet, and at an elevation of 1,600 feet above the level of the sea, showed an increase in heat at the rate of one degree Fahrenheit for every 55 feet, while another at Mendorf, in Luxemburg, which penetrated to the depth of 2,394 feet gave an increase of one degree Fahrenheit for every 57 feet.

DEDICATION OF THE SOLDIERS' MONUMENT AT DOYLESTOWN.—On the 30th of May a monument to the memory of the fallen soldiers of the 104th Pennsylvania Regiment was dedicated at Doylestown. The citizens of the village and vicinity turned out in large numbers. Detachments of the National Guards, Grey Reserves, and Washington Grays and a large delegation of Philadelphians participated. The monument is thirty-four feet in height, and built of marble and granite, a *fac simile* of Cleopatra's Needle. It cost \$2,984. It bears an inscription to the memory of the officers and soldiers of the 104th Pennsylvania Regiment who fell in the late war, with the names of the battles in which the regiment participated run wreath-like around the shaft. An oration was delivered by General William H. Emory, and an ode was sung by an amateur choir. General Charles G. Halpine, ("Miles O'Reilly,") who was to have read a poem, was not present, but Generals Patterson, Hoffman, and other military celebrities were present.

THE demand for cheap shoes has been so pressing of late years, says the *Lynn Reporter*, that it has induced the most rigid economy in the manufacture. Hardly a scrap of leather is allowed to go to waste. The wagon-loads of odds and ends made in cutting—the refuse of the splitting-machines—are all worked up again into that kind of leather known as "pancake." This is made by pasting and pressing together the scraps of which we have spoken. This being rolled and dried, is made to do service in the cheaper grades of shoes as inner-sole leather, or as "lifts" for heels. So skilfully are these operations performed that sometimes the substitute is, for some purposes, almost as good as the genuine article. Some firms do a large business in the manufacture of "pancake," which is accomplished by powerful machinery driven by steam.

A MONUMENT ERECTED IN THE MAMMOTH CAVE.—The *Nashville Union and Dispatch* says: About forty members of the National Division of the Sons of Temperance, after leaving this city on their return home, stopped at the Mammoth Cave to look into its mysteries, wonders, and beauties. After making the usual explorations, Thomas Chubbick, of Massachusetts, suggested that a monument be erected to commemorate their visit, and to be perpetually known as the "Sons of Temperance Monument." The idea was commenced near the Gothic chapel, a little to the right of the path that leads to the celebrated chapel. The corner-stone was laid with appropriate ceremonies by M. W. P. Robert M. Foust, of Pennsylvania, assisted by the brethren. It required three persons to handle the corner-stone. Each member present then placed a stone upon the monument, which is now about five feet high, and it is requested that every Son of Temperance who may hereafter visit the cave shall place one stone on the monument, and only one, so that as many as possible may personally engage in its erection. After the work was thus far completed, Mr. Foust dedicated the monument to the principles of "Love, Purity, and Fidelity," and to the Order of the Sons of Temperance, after which the members present formed a circle around the newly-begun monument and sang a hymn.

On the eastern side of the monument are the letters "S. of T.," and the work was executed without the sound of hammer or axe or any tool of iron. If each Son of Temperance will add his one stone to the work, it will in time be one of the "sights to be seen" in the Mammoth Cave. The guide will show it in future to all visitors.

M. GAUDIN has discovered a process by which he can produce imitation diamonds, etc., of any color and shape, that will cut glass. This may cause quite a revolution in jewelry.

MICHIGAN COAL MINES.—There are now in operation several very important coal mines in the State of Michigan. The coal is adapted in its different varieties to almost all purposes, whether for use in machine shops, or railways, or steamboats, or for domestic purposes, and at the mine commands from \$2 to \$5 per ton, according to the quality. Last year 9,000 tons were turned out from one mine, representing an aggregate value of about \$31,500. The markets are the Michigan Central Railroad, which uses the coal both on those freight and passenger engines which are coal-burners, the cities and towns on the Michigan Central, especially a very large trade in the city of Jackson, as indeed is that over the line, and now a new, and what will eventually prove a large, market has been opened by the construction of the Jackson, Lansing, and Saginaw Railroad. Wood in the city of Jackson ranges from \$2 to \$6 per cord. It is as yet uncertain whether mining will be recommenced in the spring or not. The aggregate production of coal in this State, for 1867, was about 25,000 tons, representing a value of \$97,000, and as the business is certain in future to rapidly increase, it can justly be regarded as one of the most promising sources of Michigan wealth.

LIGHTHOUSES IN THE WORLD.—The following details respecting lighthouses are from a French source: On the 1st of January, 1867, there were in the whole world 2,814 lighthouses, of which 1,785 were on the coasts of Europe, 674 in America, 162 in Asia, 100 in Oceania, 93 in Africa. As regards Europe, the country which possesses the most lights in proportion to its coasts is Belgium. She has one lighthouse for every 3 kilometres (rather more than three miles) of coast; next comes France, with one per 13 kilometres; next Holland, with one per 15 kilometres; then England, with one per 17; and afterwards

Spain, Prussia, Italy, Sweden, and Norway, Portugal, Denmark, Austria, Turkey, Greece, and last of all Russia. The last-named power has one lighthouse for 123 kilometres, while Turkey has one for 102. The United States have one lighthouse for every 32 kilometres, and Brazil one for 140. Of the 2,814 lighthouses, as many as 2,300 have been established since 1830, and the greater part of those which then existed have had their lighting power increased. Posterity will say that the present epoch has maintained profound solicitude for saving lives at sea by means of the lighting of coasts; but much still remains to be done.

THE UNION PACIFIC RAILROAD.—Six hundred miles of the Union Pacific Railroad, west from Omaha, have been completed, and are to-day in full working order. With rapidity almost without precedent, and certainly beyond the expectation of the most sanguine, has this road been pushed forward. The management, recognizing the great interests which stand ready to start up the moment the continent is spanned, have pushed the enterprise with an industry meriting the highest commendation. Already can the traveller from Philadelphia, on an unbroken line of railroad, travel westward for a distance of seventeen hundred and fifty miles. So quickly is every obstacle being mastered, every impediment of nature overcome, that the Directors are able to predict that in all probability 1869, and not 1870, will see the first train run from ocean to ocean. With the opening of the road will come immediately a rush of traffic. It is as if a deep canal was being dug to connect Ontario and Erie. From both ends flow the waters, and the moment approaches when the last intervening foot of land will be overcome, and the great tides will meet and flow along the new-made channel.

SURVEYS OF JERUSALEM AND SINAI.—Colonel Sir Henry James, Director-General of the British Ordnance Survey, reports that the expense incurred by publishing the survey of Jerusalem will soon be more than covered by the profits arising from the sale of copies. The demand, especially for the photographs, has been so great that it has been difficult to meet it during the winter months, as very few photographs can be taken. The survey of Jerusalem having given so much satisfaction to the public, the Rev. Pierce Butler, of Ulcombe Rectory, Kent, proposed that a survey of Mount Sinai, of a considerable portion if not the whole of the peninsula of Sinai should be made under the direction of Sir H. James, with a view to identify the route taken by the Israelites, and the places mentioned in the Bible. Mr. Butler had obtained the sanction of the Secretary of State to the undertaking, and had issued circulars which brought subscriptions from several noblemen and gentlemen desirous of seeing this survey made, and he had paid his passage to Alexandria, with the intention of proceeding to Cairo and Suez, for the purpose of making preliminary arrangements for the expedition, when he was suddenly taken ill, and died in February, on the very day he was to have left England.

PHOTOGRAPHS IN COLORS.—A Paris letter says: "At a recent meeting of German photographers, Herr Grune exhibited a remarkable photograph representing the natural colors; at least so says the report. Another very remarkable invention is that of a Saxon officer, Lieutenant Miersch. By a slight alteration in the mechanism of the Prussian needle-gun, he renders it capable of firing thirteen shots in the minute, instead of eight as at present. But the most wonderful part of the story is, that the alteration costs only two gro-schen, about $2\frac{1}{2}d.$, or five cents."

ABOLITION OF FENCES.—This subject has been exercising the attention of Western farmers for some time; and even England now speaks of the propriety of doing away with all fences. The matter is easy enough. There is scarcely a township in this State that has not some protection in the way of preventing cattle running at large. If the laws governing estrays were enforced, farmers would have no need to fence out stray cattle. Two-thirds less fence would do on the farms, for, instead of surrounding it with fence and then dividing it up into small fields, four or five divisions of an ordinary farm would suffice; or even less, if the economy of fencing were carried to its fullest extent. The four divisions of a farm, containing the cereals, wheat, corn, and oats, and the grass for hay, need not be separated. The fifth division for pasture-lands would of course have to be enclosed. One fenced division then would suffice. What would be saved? First, the immense expense of constructing fences and keeping them in repair; second, the ground upon which the fences stand, which is no mean item. Every 2,240 yards of worm-fence takes up an acre of ground. The fencing of a single acre appropriates one-eighth of the soil. Thus, on every well-fenced farm of 100 acres, five or six of those acres, or a good-sized field, is occupied by fences, as we think, unnecessarily.

REFINING SUGAR.—The improved process, patented in Germany by Messrs. Pierre & Massey, consists in bringing saccharine juice, after being clarified in the usual way by means of lime and carbonic acid, to a boiling temperature, and precipitating it with caustic baryta; the precipitate is then suspended in water, and decomposed with carbonic acid. About 60 parts of baryta is required for every 100 parts of sugar. The sugar solution, thus purified, is afterwards evaporated.

ARTIFICIAL FISH CULTURE.—It is made the duty of man to repair, in so far as he can, the ravages of his species, committed in the hurry of settlement or by continued and indiscreet use afterwards of nature's bounties. When we add to duty the gratification of pleasurable instincts, and then couple with both of these a fair promise of profit, we have an incentive which will overcome all obstacles, and insure in any department an entire success. In agriculture the farmer makes it a point to preserve his seeds and improve their quality by all the means in his power. Experiments are called in to aid science and to make science, and the pride and profit of success amply repay all troubles and outlays. In maintaining his breeds of live stock and improving the rough material he often finds on hand, great enthusiasm is manifested. There is a branch of culture, which might be called co-ordinate, that has lately sprung into existence. We mean the culture of fish by artificial means. It has grown out of a necessity, compelled by the reckless conduct of man. Every one deprecates the fact that our rivers have become depopulated of the finny tribe; that so great a source of pleasure as successful angling has been cut off; that our tables are deprived of their most healthy and delicate messes, and that what was heretofore a source of respectable income has ceased as a business, or become the synonyme for losses. Under the impression that there existed a corrective for what may be fitly termed an evil, the experiments of private individuals have been seconded by many powerful societies, and these again by intelligent legislation, so that now we may regard two or three things as well settled in this connection.

First. That our depleted streams can be restocked with fish.

Second. That with due care on the part of individuals and companies in providing for the passage of fish through their dams and obstructions erected for manu-

facturing purposes, and with discriminating laws on the part of legislatures, the stock of fish can be kept up with little or no outlay.

Third. That the ancient profits of a now reduced trade may be restored, and a cheap food provided in great abundance.

In this, as in all other subjects, general reasoning will not go so far as actual experiment to prove its truth. We therefore educe a few of the results thus far made in proof of the success of the enterprise. Under the legislation of our own State a fishway was built in the Columbia dam. Shad passed through it in large numbers, and were taken above the mouth of the Juniata for the first time in nearly thirty years. The result shows that shad will not only return to the place of their birth when opportunity offers, but go beyond it in search of new spawning grounds. Thirty years ago the supply of salmon to the markets of Boston and other cities in the East, was brought from the rivers of Maine. Now, by reason of high dams and other obstructions, this fish has become almost extinct, and the supply comes from Canada.

PYROGALLIC ACID.—The old process for making this compound usually gives only 25 per cent. of the weight of gallic acid employed. Messrs. de Luynes and Esperandien, by the action of heated water, transform gallic into pyrogallie and carbon acid. Into a brass cauldron having a tightly fitting cover they introduce gallic acid with two or three times its weight of water. The cauldron is then heated to 200 or 210 degrees C. and that temperature is maintained for nearly two hours, when the solution of pyrogallie acid will be found slightly colored. The color is removed by bone-black and the water by distillation. A clear white product may be obtained at once by distilling the gallic solution *in vacuo*.

REMARKABLE MIRAGE.—A mirage was visible lately at Dover, England. The dome of the Cathedral and Napoleon's Pillar, at Boulogne, were to be seen from the Crescent Walk by the naked eye; but with a telescope of ordinary power the entrance of the port, its lighthouse, its shipping, and the surrounding houses, the valley of the hillside of Capecure, and the little fishing village of Portel, were distinctly visible, whilst on the eastern side the principal features of the country, the lighthouse of Cape Grinez, the adjacent windmill, numerous farms, and villages, with their windows illuminated by the setting sun, stood out with extraordinary clearness. Whilst these were under observation, a locomotive was seen to leave Boulogne and travel some miles in the Calais direction, by its puffs and wreaths of white steam. Shortly after sunset the mirage subsided.

A MIRAGE IN WESTERN NEW YORK.—A correspondent of the *Rochester Union*, writing from Batavia, N. Y., June 3, says: On Monday last, while walking in the suburbs of the village, I was surprised to see, stretching away to the northeast, and apparently on a level with an adjoining meadow, a lake, the undulations of whose waves were plainly visible, and on which four steamboats and two sailing vessels were to be seen moving slowly along. Far away in the distance was the Canadian shore. The pale blue-green tint of water was perfectly reproduced. The delusion was heightened by the rising ground in the meadow forming a bank from which the lake appeared to roll. It was almost impossible to reject the temptation of crossing the fence and gathering the shells and watching the breakers which it seemed must be at the foot of those little hills. I watched the mirage for nearly an hour, but returned before the disappearance of it. This mirage far exceeded the fine one of Lake Erie seen some weeks since at sunset, and which attracted universal attention.

A NEW CATHEDRAL.—The ceremony of laying the foundation-stone of the new Catholic Cathedral of Brooklyn took place June 21st. Announcements had been made during the past two months, that this event would be attended with circumstances of no ordinary interest; that it would be witnessed by thousands of people, and that it would be the occasion of a demonstration the like of which had never before been seen in Brooklyn. These announcements and predictions have been fully verified, and the scene of yesterday, in which bishops, priests, and the laity of every grade, and trades, associations, and temperance and benevolent societies bore their part, passed off with an *eclat* not usually displayed on similar occasions. The cathedral will be in the style of French Gothic of the thirteenth century, and is to occupy a prominent site on Lafayette avenue, between Clermont and Vanderbilt avenues. The extreme length, from the towers in front to the rear of the chapel, 354 feet; length from front entrance to the rear of the apse, 264 feet; extreme breadth at the transept, 180 feet; extreme breadth of nave and aisles, 98 feet. The large towers in front will be 50 feet square at the base, and 350 feet in height from the surface to the top of the cross. The small towers at the transept, 27 feet at the base and 185 feet in height. The top of the nave roof will be 112 feet high above the level of the street in front. The aisle walls will be 85 feet high above the floor; aisle ceilings 56 feet. The cathedral will be well lighted. The sanctuary is to be 54 feet deep and 88 feet wide.

THE manufacture of rubber heel-stiffening, a new thing in boot and shoe manufacture, has recently been begun at Chelsea, Mass. These stiffenings are said to be superior to leather, for the reason that they will not "run down," and are unaffected by water.

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MONTHLY REVIEW.

PALLADIO AND HIS STYLE.

IN Northern Italy, less than thirty-five miles from the Adriatic sea, and not more than sixty from its head, forty miles west of Venice, on the Bacchiglione,—surrounded with empty moats and ruined walls, but full of well-preserved palaces,—with the blue spurs of the Alps within easy reach, upon her northwestern quadrant, and their white crests looming up beyond,—stands the ancient city of VICENZA. Within it was born, in the year 1518, ANDREA PALLADIO, who,

“Though from an humble stock, undoubtedly
Was fashioned to much honor from his cradle.”

We hardly know, which most to admire; his good fortune, yielding him the direction of highly important constructions in his early youth; the force of character, which enabled him to become eminently learned, not only in his chosen profession of architecture and the general science of that day, but also in the classic languages; or the rare social engagingness, to gain such esteem among his fellow-townsmen, as to be first made free of his native city; and, afterwards, to be admitted into the body of the nobility.

Palladio's professional master was the celebrated *Giovanni Giorgio Trissino*, under whom he studied exhaustively the most curious points of civil and military

architecture, and stored his mind “with all sorts of erudition.”

He chiefly delighted in the personal inspection, and exact measurement, of the grand remains of old Rome; so much so, that he “traveled divers times “to various regions of Italy and other “foreign parts, on purpose to find, “through the remains of some ancient “erections, what the whole must once “have been; and to give the designs of “them.”

His posthumous work on “THE ROMAN ANTIQUITIES,” though imperfect, conclusively shows how thoroughly he had mastered the ideas of the ancients, for, “searching many years, amid various dangers,” amongst the rubbish of their monuments, he discovered the true rules of the Art of Building, which, unsuspected in their completeness, even by his contemporaries, *Brunelleschi* and *Michael Angelo*, remained unknown, until after his exposition. The exactness of his designs is equally remarkable and satisfactory.

His appreciative townsmen and contemporaries were culpably careless of the future reputation of their most noted citizen, as all the authors, who mention him, are silent on the particulars of his life. They have taken great pains to provide for us a detailed list of the noble edifices, wherewith he adorned his coun-

try; but to little avail, for they are extant, drawn and explained by himself, in the second and third books of his "Architecture."

His preface shows him to have been both genial and patriotic—equally proud of Vicenza, as Vicenza of him—for he speaks of his native place, as a city "which, though not very extensive, is "sufficiently rich; and full of inhabitants of the brightest capacities;" and mentions by name, his preceptor, John George Trissino, and quite a number of other distinguished Vicentines, as scientific noblemen, gentlemen, painters, poets, architects, and universal scholars.

He flourished, in action, through rather more than two-fifths of the sixteenth century; and died in the year 1580.

Not impossibly there yet remain—amongst the vast stores of inedited manuscripts, in the public and private libraries of Italy—some unpublished drawings and writings of this grand old Vicenzan. If so, may they soon appear, for both the literary and the architectural worlds would hail them with unwonted zest.

THE PALLADIAN, then, with its congener, the *Soanean*—and its legitimate derivatives, the *Anglo-Italian*, and the *Americo-Italian*—along with the Italian as modified by the climatic exigencies of all countries, wherein any considerable part of domestic life passes with wide-flung doors and raised sashes, or in the open air—must predominate in modern architecture.

As adapted to palaces, or public buildings, the Palladian proper is distinguished throughout most of its greater forms by its adherence to Greek principles. The important lines of the edifice strike horizontally; the columns and pilasters are light and graceful and conform to settled orders; the colonnades are roofed on lintels, instead of arches; the doors and windows are parallelograms with conformable mouldings; or, if they have pediments, these are either

of a very obtuse angle or of a low arc; the roofs are low and hidden by the pediments and statue-bases, pedestals, or acroteria of the façades and the balustrades of the eaves, so that neither roofs nor gutters are perceptible from any position below the apex of the pile; and thus squareness, with its attendant power, is preserved in composition. Classic statues adorn the prominent points of the roof and also of the attached approaches and covered galleries. The chief apartments are on the second floor, thus admitting magnificent approaches, in ample stairways and landings; and allowing different chaste methods of presenting the ashlar of the lower story. The ground floor contains the more important apartments for routine business. The lesser offices are in separate buildings, connected with the pile itself by low-covered galleries, with, it may be, an additional promenade upon the roofs. The chief Roman feature, the dome, whether depressed or exalted, is kept elliptical, in its upward sweep from the cornice of the tholobate, and is often terminated by a colonnaded lantern with a dome roof; the general ornamentation, neat, severe and permanent, is not extraneous, but grows immediately from the subject. Solidly based and heavy stone balustrades, with vases, statues and heraldic figures, well-flagged pavements and classic fountains, diversify the greensward and the shrubbery of the grounds. In favorable situations, successive parterred terraces carry the downward slope fairly to the edges of the sharp and deep declivity; miradors and belvideres afford the inmates every facility for enjoying the prospect; and enhance the external charms of the place.

In the case of a villa, or of a country mansion, as many of these points are preserved as comport with the wealth, dignity and taste of the owner.

This style admits of balconies, either supported upon the earth, through pillars or pilasters, or from the building,

through brackets or cantilevers. Although we have described a Grecian roof, modified by eave balustrades and façade statue pedestals, it allows either the Tuscan roof or the flat roof; yet all these are low, and restricted to nearly the same lines. It permits also circular heads to niches, doors, and windows; and, by way of ornament to the latter, when they have lintels, it indulges quite considerably in the broken pediment, which—although we have nothing to remark against it as a mystic symbol amongst the Freemasons, or as an appropriate adjunct to any Masonic hall—architecturally and critically weighed, must be felt as a defect, however strenuously, from habit or from need of a broken line, architects may defend it; for the angular lines of a true pediment represent two rafters well braced in the angles made by them with the horizontal line, and able to uphold both each other and the ridge-piece, which rests upon their apex; whereas, if the pediment is broken, or, in other phrase, the upper and joining ends of these rafters are cut off, the place of the ridge-piece is vacated, the ridge-piece itself is unsupported, and the rafters, so far from being fit to support any superincumbent weight—which they often do, without any ridge-piece—are unable to hold themselves up. It is in matters of this sort that the world misses the subtle adaptation, the inevitable truth of the Greeks. Theoretically, any base of support is supposed to be strengthened commensurately with the pressure or weight to be upborne, and a moulding is a strengthening hem, border, band, or bond. Practically, the designer of the broken pediment supplies the integrally connected strong angle he cut away by a detached urn, or something of that description; supports the urn upon the feeblest part of its remaining substance; and, after sawing across, or breaking, the rafters of its gable or gablet, expects them to upbear, either a part of the structure, or a detached weight. For any coherency of purpose,

we might as well expect stability in a pyramid resting upon its apex, with its base in the air.

This paradox in action is almost equal to the paradox in diction, wherewith the Egyptian priests amused themselves at the expense of Herodotus, the Father of History. They told him, that the pyramids were finished from the top downwards, leaving him to infer, if he were unsophisticated enough, that they were commenced in the air, and gradually worked downwards to a solid foundation upon the bed limestone. They were finished from the top, and could not be finished in any other manner. When Herodotus saw them, about B. C. 450, they were cased smoothly, from base to point, the point itself running out to a sharp angle. This—as Dr. Lepsius, the distinguished Egyptologist, has since proved—necessitated their being finished from the top to the bottom. The pyramids were built, although the Coptic hierarchs did not find it necessary to suggest as much to Herodotus—in great steps, so that when any one was finished as to its chief mass, the uppermost step would be approximately a cube in shape. A line drawn from any of the four upper, outer angles of this cube to the centre of the outer base of the pyramid, upon that side, would just touch all the outer angles of all the great steps on that side, from the summit to the plain. For the purpose of weathering, though hardly needed in that climate, we may suppose the very peak-block of stone, to be itself a pyramid, of exactly the same slant of sides as the pyramid whereof it formed the crown, and that it projected a little way beyond the sides of the highest square. This cap-stone being placed, next below it would be fitted others, step by step, each range overlapped by the range above it, and the outer surface of all the ranges kept upon exactly the same angle of finishing surface by the chisel of the stone-mason. The steps themselves would furnish the scaffolding; and, when each step was filled

up, that part of the scaffolding was itself resolved into the finished structure, until at length, when the ground was reached, the pyramid would not only be finished, but, from its sharp rise, would also be inaccessible, unless a special staircase had been excavated in the casing, in proceeding from the top to the bottom, or were afterwards chiseled out, from the bottom to the top. At all events, any reader will here see at once that the pyramids could only be finished "from the top downwards." This discovery was suggested to, and instantly proved by, Dr. Lepsius, through a glance at what is called "the Pyramid of Two Inclines," at Saccara.

While an occasional stir is caused in the newspapers through accounts claiming astronomical uses for the pyramids, it is well known to all who have had even the hastiest glimpse of the writings of the Champollionists, that the primary intent and absolute use of all the pyramids was for royal sepulchres. Astronomical service they might possibly have rendered incidentally, but their object and occupation as kingly burial-places is fixed, *maugre a doubt*. But we have digressed.

To recur :

Waiving the metaphysics of architecture, we must admit, that, following the frequent practice of Palladio himself, many of the best modern architects have been quite addicted to the use of the broken pediment. They might perhaps, upon refining to the utmost bounds of thought, confess, that in themselves, there were many adjuncts of architecture they liked better; and, if devising, each his ideal of a perfect edifice, omit it; but would assuredly defend it, for domestic uses, upon the principle of "humoring perspectives of buildings"—of not insisting upon strict linear perspective in drawing animals or men, for fear of the surely resulting hardness and stiffness—of the need of alloys in metallurgy—of the desirability of occasional discords in music—of very occasional inharmonious contrasts in coloring

—of not infrequent harshness in higher poetry—and of the intended imperfections in humanity. True it is, that pure gold is utterly useless, except to gaze upon, as the most beautiful orange color on the globe; and that it will answer neither for gold-leaf, jewelry, nor coin, until alloyed with a fair proportion of silver and a little copper; that pure silver must be alloyed with a little tin and copper, even for leaf, and considerable copper for plate or for coin. It is equally true, that men and women may be so good, as to be good for nothing; and that the best characters are self-eliminated, under DIVINE GUIDANCE, by reasonably good souls striving to become better; but never able in the highest sense to become really good. Even if they succeed in attaining what they once conceived to be the crowning height, they are all the better able to descry a point above. Unquestionably, then, whether widened above or below, the broken pediment—by way of two contrasts,—the first, of recollection; the second, of juxtaposition—conduces to a higher style. The English architects, of the period of James I., obtained the latter contrast, by running a coping along, up and over, all the reëntering and salient angles, and convex, or concave, curves, of their generally fantastic, but at times comely gables:—or, by carrying a tower, string-course along the thus hidden eaves and over the grotesque false-gablet of an oriel, to become the course-moulding and bay-supported balcony-base of a porch-advance, or a transept; and, so, reversing the order of transition to the twin tower—perhaps to descend the outer angle and ramify similarly over the attached offices. It is about the only characteristic whence a new principle might have grown.

THE SOANEAN, COUSIN TO THE PALLADIAN, while adopting circular arches, yet treats them as they would probably have been managed by the Greeks. The Roman ornamental arch is justly liable to be considered an anomaly, because it

does not spring smoothly from the vertical sides of the aperture, but from the projecting interposed capitals of the two, or more, pillars, or pilasters. The method of Sir John Soane is much more analogical. The mouldings spring perpendicularly from the sills, continue along up the jambs, on one side; run imperceptibly into, and throughout, the semi-circular architraves, and descend smoothly along down the opposite jambs, to the sills again. An adherence to this, throughout a building, impresses the beholder, or the inmate, with the idea of superior neatness and grace. The only thing, yet to desire, is not to stop with this management of semi-circular arches; but to vary the arch heads, mainly by elliptical curves struck indefinitely between the semi-circular architrave and the absolutely flat lintel; although the various arcs, meeting the jambs at an angle, but with continuous mouldings, are agreeable to a critical eye. Yet what we wish to insist upon is, that exceeding elegance, at minimum cost, resides in the variously curved architraves, commencing with the true half circle, in the first story; and passing through more and more depressed curves, with each succeeding higher story, until, at the top, we either absolutely reach, or approximate, the horizontal lintel. Another advantage of this mode is—that, with the doors and windows kept properly, one beneath another, so as to insure the integrity of the piers—it gives the maximum amount of strength to the walls. This will equally apply to the management of arches formed by arcs.

The Italians discarded the Greek principle of the parallelogramatic ground plan, adopting instead the square plan for their public buildings. Consequently there was no opportunity for reproducing the Pagan temple, with its Doric style portico, either in their churches, palaces, theatres, or halls; so they took the portico from the temple and placed it against the front wall of their edifice,

whatever that might be; and whether appropriate or not. If they could not draw in the portico, another misapplication of their drag-net hauled up the pseudoprostyle or architectural mask, and fairly—or foully?—stuck it against the wall, where, while it might have cohesion, it could have no more coherence, than an antique *alto rilievi* hung upon the wall of the club house finished last. With Sir John Soane consistent imitation of the ancients was a passion. For instance, he himself stated that when in Italy he resorted to the Temple of Vesta, at Tivoli, for six successive weeks, measuring and drawing its details. He was very partial to the insensible resolution of the walls of quadrangular apartments into circular flat-domed ceilings; and also, as in the Bank of England, for quadrant-planned, columnar mergements of fronts into flanks.

We have styled the SOANEAN the PALADIAN, and, taking a comprehensive view, it can scarcely be regarded otherwise. Though good authorities class it, indifferently, as Greco-Roman, Romano-Grecian, and Anglo-Grecian, yet either of the first two of these appellatives would be a good synonyme for that style, which we shall also venture to name the Vicenzan or the Vicentine, from its founder's birth-place.

Sir John Soane's reputation is supported by his magnificent designs for aristocratic mansions, municipal halls, courts of justice, senate houses and royal palaces. No professor's mind ever went less in what Shakespeare calls* "the roadway." He was consequently pretty sharply handled by the critics of his day, but has since been highly complimented. Some professional critics hold Sir John's aim to have been the fusion of the classic delicacies of Greek and Roman composition, with the playfulness of Gothic, not by the use of the pointed arch; but, through "the princi-

* Consult Prince Henry to Poins, in the 2d Part of King Henry the Fourth.

ple of continuous lines, ramifying from the vertical into the circular, without horizontal impediment." At all events, his mind had some insuperable impediment to the use of the pediment. Whether entire or broken, he eschewed this altogether, save where it spanned the whole edifice, as in the classic temples of Greece and Rome. His surfaces, frequently very simple, are sometimes characterized by sunken fretting and channelled work; and again by zig-zag groves and guilloches.

THE ANGLO-ITALIAN roofs, while not, in any degree, to be termed elevated, are yet not so depressed as the Italian, there being presumably a more copious rain-fall to turn, and a much greater weight of snow to resist; but as the general Italian is universally held to be the most appropriate for lofty situations, a high roof might be stripped of its covering by the fierce winds. The roof commonly chosen is Tuscan, which, while its gable is a low pediment, projects well beyond the walls, upon purlins, often converted into cantilevers, and thus protects them, and shelters the family. The doors and windows are, variously, either square or Grecian; semi-circular with columns and pilasters, or Roman; semi-circular with continuous mouldings, or Soanean; or struck in arcs, which we may entitle modern at large. Balconies, colonnades, open galleries, porches and balustraded terraces, or esplanades, well-advanced, make up the contour. The bed-room windows, shielded by the overhanging roof, demand no caps to the architraves. The lower windows, except those within the colonnades and porticos, are guarded with console caps or with cornices. The square tower is derived from the Italian campanile or bell-tower—formerly in Italy, where, not ecclesiastical, attached to villas as a token of nobility; often used, in the troublous times, as a watch-tower, provided with a great bell for alarming feudal retainers; and, in its native clime, sometimes covered by a

flat hip roof, which being square, and terminating in a point, we will also designate as an obelisk roof. This tower, elevated at least one story above the main building—frequently two, and occasionally three—is partly closed in by a Tuscan roof of four projecting pediments or depressed gables. The whole is surmounted by an open colonnaded and domed cupola or belvedere. The portico can readily be so managed as to avert the stress of weather from persons leaving the main entrance and stepping into a carriage. The roof of the portico is the floor of the *loggia*, or large, open, balustraded gallery* connected with the principal bed-chamber.

Here, then, are all the requisites for winter and summer comfort, in a climate not very inclement, like that of England. Yet most of these very points have arisen from the balmy air and brilliant moon of Italy, and are not quite at home among the less-violent changes of temperature, but more prevalent fresh breezes, mists and clouds of the sea-girt land.

THE AMERICO-ITALIAN STYLE, as differing distinctively from any of the others herein discriminated, is rather unsettled as yet, and indeed, for the United States, must vary indefinitely, as we pass from the centre of the Middle States towards any part of the great border.

The New England States—with the deep snows of their long and searching winters, their northeasters and balmy airs, their intense suns and brilliant moons, their late springs, fierce summers and gorgeous autumns—would seem to need a commingling of the domestic pointed Gothic for the main body of the house, with Italian salient appendages, because one extreme of climate demands security, and the other insists upon plenty of light and the open air. The terrace, the folding canopy, the portico, the gallery, both covered and open, the balcony, the *loggia*, the campanile and the belvedere all seem to be needed; and,

while their mass must certainly come from the Italian, their structure and decoration must surely be derived from the Gothic. The oriel or bay-window must not be omitted; but that is already Gothic. There would be no great difficulty in devising every part of the building—save the roof, which must be “pointed” to shed the snow—inside the Tudor Gothic, sometimes, not very happily, we think, designated “debased.” It occurs to us, that, in the balconies, open galleries, loggias and balustrades generally, very good and congruous effects may be obtained by simply inverting some varieties of Tudor tracery. This general treatment would leave all the ceilings, excepting those of the upper story, either flat or comparatively so, and, with corresponding windows and doors, would thus render the building fitter for seeing, hearing, warming and ventilating.

Whatever we may feel about its lofty beauty, the pointed Gothic ceiling in domestic architecture, is only adapted to a summer state apartment, off to one side of the house, to which the other tiers of rooms would be but as *entresols*, or to a summer library. It is on account of modern civilization requiring comparative lowness of stories and squareness in the cross-sections of ceilings, that the Palladian has grown to be such an universal favorite.

The Northwestern States have winters of severe cold and plenty of snow, but of great equableness; and, on the latter account, are as free from the great scourge, consumption, as the Northeastern States are subject to it. Hence, the trans-Mississippi plateau needs also the peaked roof. In fact, this region, where the mercury is frequently below zero as late as March and as early as November, wants much greater provision against the cold, than facility for any summer life *al fresco*, yet the thermometer in July frequently marks 96 degrees.

The Lake-shore States, in the long

run, require much the same arrangements for domestic comfort as the Middle States. The whole of both divisions, along with all the Southern and South-western States, are best suited in full Italian designs, with, proportionately, more compactness and less provision for out-door life, in the two former, and the reversal of these conditions in the two latter. The general climate of California asks for the Palladian, and that of Oregon and Washington for the Pointed, which will doubtless, also, be indispensable in many points of Alaska.

Thus it will be seen, that, while the POINTED is our frequent refuge, our abiding stronghold is the PALLADIAN. It is the chief charm of this altogether charming style, that it impresses us most, in the most commanding positions, being both for, and of, the landscape, or, well-placed, one of the best points to grasp a prospect, or to include in one. The Gothic, on the contrary, accords best with lower and more sequestered situations, and this, even in its most imposing development, the minster. So constantly was this carried out, so well is it understood, that Byron, from fact, introduced it effectively in the description of his own ancestral home, Newstead Abbey:

“An old, old monastery once, and now
Still older mansion, of a rich and rare
Mixed Gothic, such as artists all allow
Few specimens are left us to compare
Withal: it lies a little low,
Because the monks preferred a hill behind,
To shelter their devotion from the wind.”

However snug the harbor of the dell may be, we want a form not only for the broad valley and the hill-side, but well-adapted to the open rolling plains, where on must always dwell the multitudes of mankind; and hence it is, that, for a home—weighing all the wants of enlightened man, throughout the world—the Palladian style must be upheld, as, beyond all cavil, the most beautiful, the most agreeable, the most commodious, the most comfortable, and, therefore, the best. Proceeding from the requirements

of, naturally, one of the most favored lands on earth, Italy, it finds a cordial welcome in another, by nature no less favored, and, by PROVIDENCE, greatly more, America. Fenimore Cooper, in his *Water-Witch*, makes one of his characters, Seadrift or Eudora, discussing the comparative climates of Italy and America, yield the palm for "pearly light, rosy clouds, and melting tints," to Italy, while allowing America to excel in "vividness of glow, depth of transition, and richness of colors." As Italy is geographically a long, narrow strip of land, washed on three sides by two indivisible seas, the charming softness of the atmosphere, the dreamy ethereal lustrous haze, in contradistinction to the briskness and brilliancy of American

air, possibly may be owing to the correlative reflections interchanged and diffused by the skies and the seas. Were both virgin lands, the bard would make America the bridegroom and Italy the bride, because the one is ardent and the other musing. But Italy has her romantic repute for the balmy airs of halcyon days, and the brilliant suns and beaming moons, in cerulean empyreans, nearly as refulgently reflected in ultramarine, or in indigo ripples—justly at the expense of grey and heavy England: for no lover ever saw, no painter ever drew, and no poet ever sung, more buoyant airs, more azure skies, more resplendent suns, or more lustrous moons, than those of the United States.

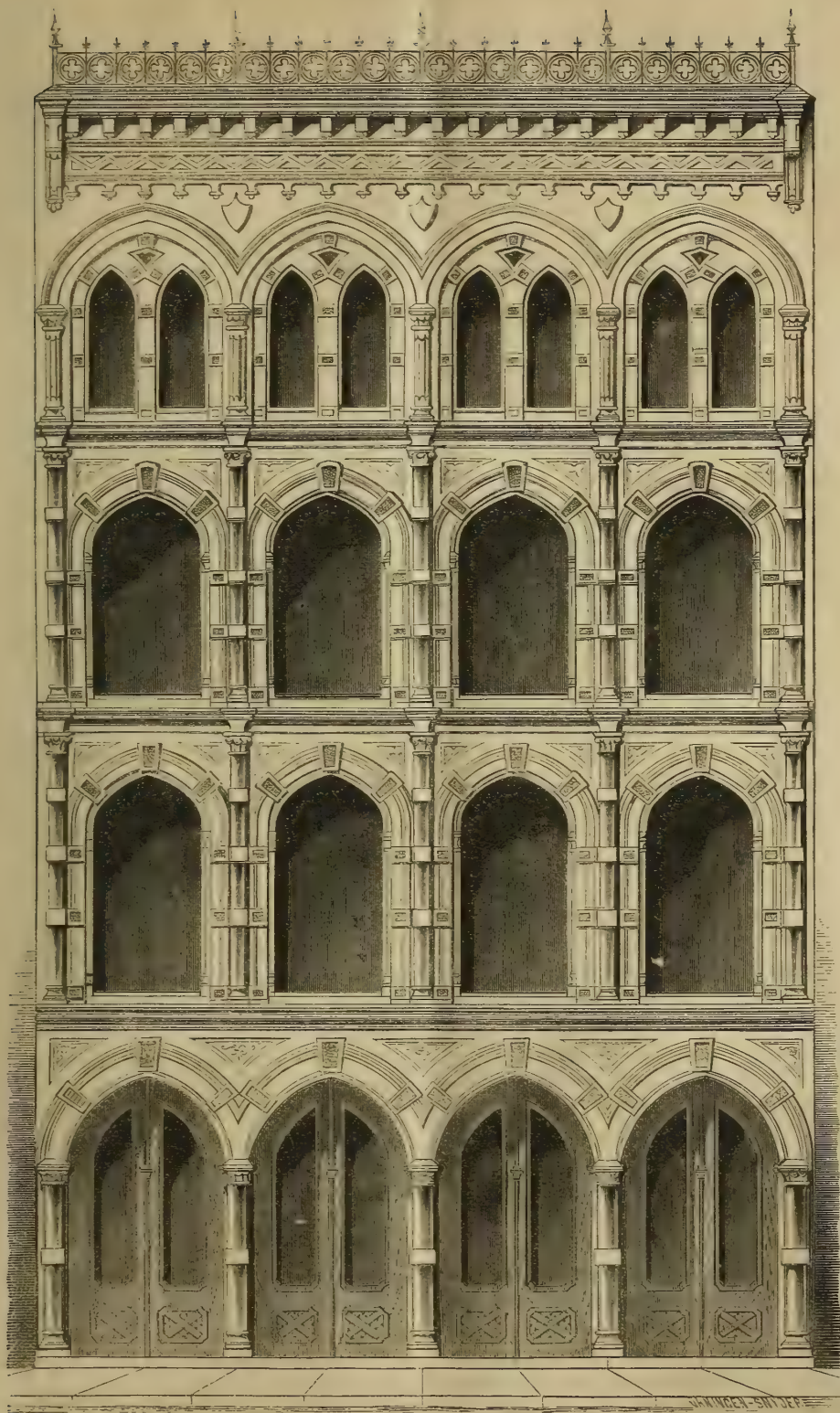
OUR PUBLIC LIBRARIES.

WE are sorry to say, that Philadelphia, once far ahead of our other cities in literary facilities, is now decidedly behind, at least two of them; to say nothing of her not equalling an university or more. This remark is not in the spirit of emulation, which is well enough in its way; but arises from communionship and experience.

If a certain thorough course of study is marked out, or if such an one, interrupted at a previous period, is to be resumed, few private libraries will afford the proper facilities and not many personal fortunes will—unless with the penalty of rapidly depleting their income by spending their principal—permit the costly and continued purchases required. The only safe means is association; and the spirit of association is apt to flag, after death removes the purely individual influence, which gave it initial efficiency. The only way to render this spirit perennial is, for liberally cultured gentlemen of wealth, in that spirit of gratitude to Providence for their own advantages, which does not rest satis-

fied merely with the verbal expression of thankfulness, but is rather disposed to have benefits pass around—and for wealthy gentlemen not thoroughly educated themselves, who see the advantages of literature or science in others, and are willing to have more of those who come after, enjoy them—in the distribution of their means by will, to endow such neighboring institutions, as are already best situated to make their bequests most available to the general public.

Among such established institutions, we name the Philadelphia Library, the Historical Society of Pennsylvania, the Academy of Natural Sciences, the Mercantile Library and the Franklin Institute. But especially should the first be fostered, until it shall attain a first-class position. The scholars of Philadelphia and vicinity really need, and can be satisfied with, no less; and the enduring influence of any community depends upon its enterprise being in the most intimate contact with art, literature and science at their very best.



VENETIAN-GOTHIC CITY STORE.

DESCRIPTIONS.

DESIGN FOR A CITY STORE.

STYLE: VENETIAN GOTHIC.

A GLANCE at the design for a city store-front, which we in this number present to our readers, will at once indicate that it is intended for a place of extensive traffic, either in a large wholesale business, or in retailing the richer-patterned and more costly goods, its applicability to either being, of course, dependent on the style of the internal arrangement of the building. The heavy outlay, consequent upon the erection of such a structure, would put the design beyond the reach, and even beyond the requirements, of any business conducted in a comparatively ordinary manner; and it may therefore, be, with propriety, styled **A FIRST-CLASS ELEVATION.**

We have chosen for the Store-front the Gothic, or, rather, what is termed, the Venetian-Gothic style, with its low arched heads over the doors and windows; somewhat resembling the Tudor Arches; and the broken-outline dressings, around the doors and windows; and also what may be termed the "story-posts," to use the practical workmen's phrase; or, as more technically expressed in Gothic architecture, "clustered columns." This combination of features is peculiar to the Veneto-Gothic style.

During the ninth, tenth and eleventh centuries, the architecture of Venice appears, from the examples still to be seen, throughout

"That glorious city in the sea—"

that ancient place, round which, through the dim vista of past ages, a halo of

poetry and romantic association still lingers—to have been formed on the model of a mixture of Byzantine and Arabic, the workmen having been Byzantine, but the designers and masters Arabians. The examples we speak of are the three noble churches of Torcello, Murano, and the greater part of St. Mark's, together with about ten or twelve fragments of ruined palaces.

To this succeeded a transitional period in which the style became more markedly Arabian in character,—with the shafts more slender, and the arches pointed instead of round. This is only observable in private dwelling-houses, and not in their churches, as they would naturally have been slow and reluctant to adopt any of the characteristics of the mosque. The date of this particular style can be fixed at about A. D. 1180, by the elevation of the granite shafts of the Piazzetta, the capitals of which are the most marked specimens of this transitional style. This was transformed gradually into the Gothic style, formed from the Venetian-Arab, by the influence of the Dominicans and Franciscans, who, introduced, about the thirteenth century, from the continent, their morality and their style of architecture, already a Gothic, and which had a rapid influence over the Venetian-Arabian school, engrafting upon the Arab forms the most novel features of the Franciscan, its traceries. The progress made by this feeling in favor of the Gothic, was gradual: and, until it had decidedly

established itself, various irregular Gothic tendencies are exhibited in some of the still existing edifices: although, as yet, no consistent type of domestic building was fully developed.

It was not until the erection of the far-famed Ducal Palace, or Doge's Residence—the type of the purest specimens of the Venetian-Gothic style—that the spirit of innovation seems to have been satisfied, as if it were impossible to summon up an idea more attractive, or an edifice more majestic and perfect. The best architects and most famous painters of Venice were employed on this noble structure, for a long series of years. A brief description of it here may be pardoned, as affording the best and clearest type of this style, which it is possible to give the reader. "The plan of this building is a hollow square, of which the sides towards the sea, and the piazzetta, are supported on arcades, the lower one having arches of wider span than that above. Its columns are partly sunk into the ground, from the accumulation of the soil. The upper one has circular traceries between the arch-heads; and is a most noble feature. It supports a lofty wall, perforated with large arched windows at intervals; the central one of either side, being decorated with a rich frame-work of later design, than the lower part. The walls are checkered with rose-colored marble." It is deeply to be regretted, that none of the original ceilings have been spared, the whole of the interior having been much damaged by fire.

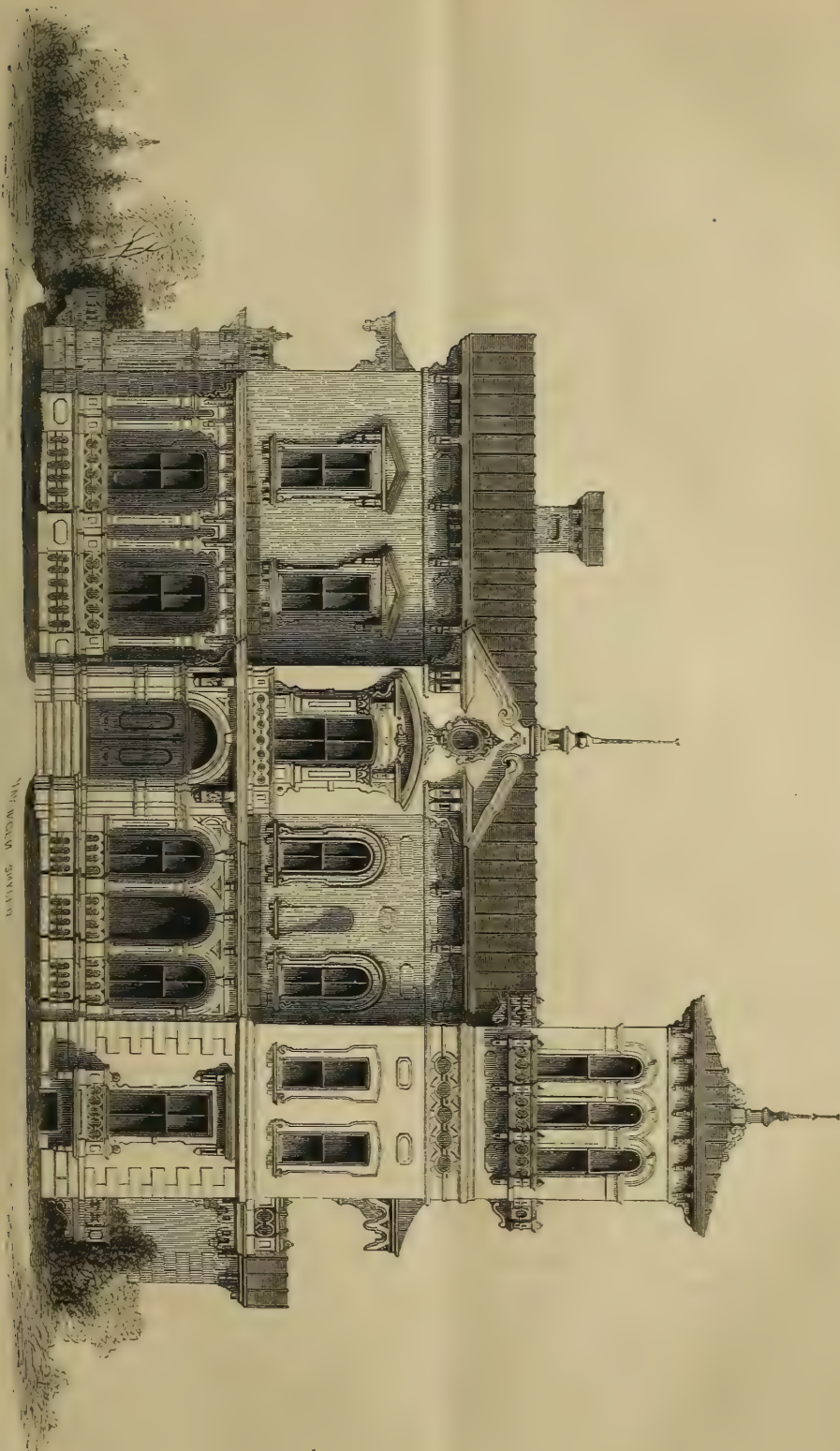
This Palace, the great work of Venice, was built successively in three styles: 1st, Byzantine; 2d, Gothic; and, 3d, Renaissance. The second completely superseded the first, of which but a few stones now remain; the third only in part superseded the second; and the present building is composed of a union of the two styles, Gothic and Renaissance. The first, viz., the Byzantine Palace, was built on the very site of the

present one, by the first Doge, Angello Partecipagio, in the year A. D. 813, when the island of Rialto was chosen as the seat of government; and the nucleus of Venice formed. Little is now known as to the form, or extent, of this, the first palace; but, from all the sources whence notices of it are derivable, we find that it was a pile of some considerable magnificence; that it was adorned with ornaments of marble and gold, and covered with sculpture. It was twice seriously injured by fire; once in the revolt against Credecius the IV., and a second time in the year 1106; but it was repaired and much enlarged, by the several successive Doges, until the commencement of the fourteenth century, when the change to which we have before alluded, came over the spirit of the architecture of Venice, then in the zenith of her power. An important change had also taken place in the character of the government, the aristocratic power having become more distinct and defined, on a firmer and more secure basis. It may be said, that the existence of the Gothic palace is contemporary with that of the aristocratic element in Venice. The work was commenced in 1301, and continued, with hardly any interruption, during the whole period of the prosperity of Venice, backed by all the energy of the aristocratic power, under successive Doges; and, in the year 1423, the Gothic Ducal Palace of Venice was completed. Thenceforward the Renaissance style prevailed. The old Byzantine portion of the palace having become ruinous and decrepit; and marring, by its incongruity, the effect of the newer palace—a fire, which occurred in 1419—and which injured very seriously St. Mark's and the Piazzetta—paved the way to a reform; and the old palace of Graini was the first to be demolished, in the year 1424.

Altogether, this class of Venetian-Gothic—of which this palace is the finest specimen—is of a most noble and grand

A VILLA IN THE ITALIAN STYLE.

J. W. WOOD, SCULPTOR.



character, possessing such an evident boldness and daring in its construction ; such a freedom from all conventional laws ; at the same time, infringing on none, that would be imposed by nature ; such a thorough appropriateness and uniformity throughout, in every minute detail of the ornamentation, so lavishly poured out on it, as cannot fail to impress the mind of the beholder, and the student.

The style, it may be here remarked, is more peculiarly applicable to secular buildings, than to ecclesiastical, to which latter, the northern Gothic—as it is to be found in France and England—is more suitable.

We will now proceed to give a short description of the material which should be employed in the construction of the Store-Front, which forms the topic of this article.

We should give the decided preference to a stone of a light color ; but, either granite, or marble, might be used, if preferred ; in the event of either of the two latter being selected, there would be a slight variation.

Should, however, brown-stone be employed for the purpose, there would be a saving, on the estimated cost of the construction, of about twenty per cent. ; or about what the expense would amount to, if a front of iron was determined upon, including the cost of painting.

We ourselves would give the decided preference to the two first-named materials ; and, as there are various shades of either, we would recommend the lightest shades possible.

The woodwork of the doors and windows should be of walnut, or other dark wood, equally hard and durable ; and should all be simply oiled with three coats of the best linseed oil, boiled, without the addition of any varnish.

The glass, throughout the first story, should be plate ; and all above, throughout the remainder of the building, of crystal sheet, double thickness.

The estimated cost of the erection of a

Store-Front, constructed of either marble, or granite, in accordance with this design, we would name at eighteen thousand dollars. (\$18,000.)

DESIGN FOR A VILLA

IN THE

ITALIAN STYLE.

This design, an old favorite and a familiar friend doubtless, to many, will, at a glance, show, that it is adapted to the requirements of a climate like ours, more particularly that of the Middle, Western and Southern sections of our country, which may be said to be almost a counterpart—during at least two-thirds of the year—of that wherein the style of architecture to which it belongs originated. It is the only style in existence that, in our opinion, conforms to the tastes and wants of the present age in America ; and this cannot be said of any of the other styles, so far as they are applicable to the purposes, and uses of domestic architecture.

The broad roofs, verandahs and arcades are leading characteristics of this style in Italy, and strictly adhered to, as indispensable. It is capable of the most varied, and at the same time, the most simple outlines ; and is the most appropriate, not only for rural and urban residences, but also for those partaking of the character of both, and neither exactly one nor the other. Of course there would be slight modifications to suit particular localities ; as, for instance, exterior architectural ornaments in the city would be more confined to a rectangular front, while in rural localities, where all sides are exposed, much more attention would have to be paid to general effect.

The leading features of this style are perhaps more familiar, than those of any other, to the general observer ; but we may enumerate a few of the more important ones. The most striking characteristics of Italian architecture are irregularity, strong and bold contrasts, and a constant aiming at what

may be termed painter-like effects. A great license is also afforded in the ground plans, admitting of almost an endless variety in the arrangement of the apartments. The windows are of varied forms; some with flat lintels, or heads; and others, again, have the half-round arch, the latter generally when the position of the opening is important; and all dressings of doors and windows are, as a general rule, made very massive, having a tendency, throughout, rather to boldness than minuteness of decoration.

The roofs are never steep, but flat, and, in Italy, generally composed of tiles; but, with us, slate or tin, the latter of more common occurrence. In all cases, the eaves are heavy and projecting, supported either on brackets or cantalivers. Heavy arcades, resting on round arched openings; verandahs, with simple posts finished with brackets of tasteful design; and chimney tops, of endless and neat pattern, prominent—and serving to give greater variety to the outline, are all marked traits of the style.

But perhaps the one, which, above all others, is an almost universal and unmistakable characteristic, is the *Campanile* or square tower, which has now come to be looked upon as an indispensable accessory to every design in this particular style; and is always adopted when the building is of an irregular form. The above are some of the more important characteristics, which mark this style. But the irregularity of the ground plan, and of the vertical outline—the consequent wide field thereby opened out—and the great freedom permitted in general design, afford many opportunities for the exercise of ingenuity and taste on the part of a skilful architect. Novelty, an aspect which this style possesses above all others, is the one which makes the strongest impression on an observer.

The great object in designing a building, so far as the exterior effect is con-

cerned, is the production of an harmonious and pleasing whole. In regular symmetrical architecture, this is comparatively easy. A beautiful design may not be the result; but viewed as a whole, it may bear some pretension to beauty. Italian architecture, on the other hand, from its very irregularity, and striking and bold contrasts, is of a more refined style; and addresses itself to a highly cultivated taste.

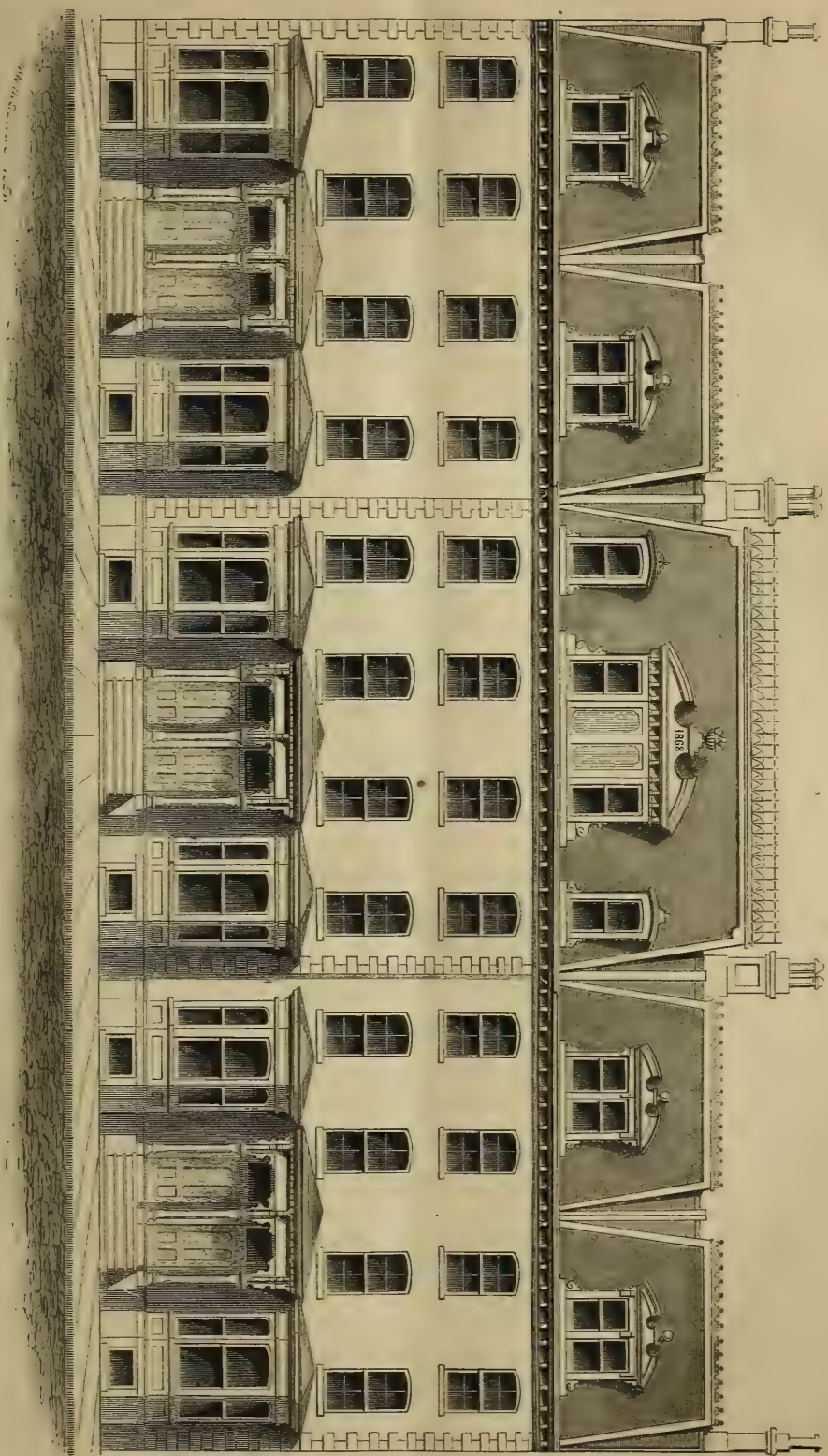
One other feature of the Italian, we might notice here: *extension*, and not *concentration*, is the abiding spirit of this style. The irregularity of its masses admits of a house receiving additions in every direction, thereby making it more suitable than any other to a prosperous and ever-improving people, like ourselves.

As we have before said, the peculiar features of this style are so adapted to *effect*, that it may be classed as one of its leading specialties. The towering *Campanile*, boldly contrasting with the horizontal line of roof, only broken by a few straggling chimney-tops; the deep shadow produced by the heavy projecting cornices and brackets, so charming, so inexpensive and so easily applicable; the rows of circular-headed windows, with balconies, the effect of which is chiefly produced by the contiguity of the window-frames; the prominent porticos, arcades and verandahs; its adaptation to any kind of site, whether even, undulating, or broken ground—giving ample scope, in the latter case, for those magnificent terraces, which vary and dignify the architecture of the Palladian era;—all these combine in one grand and picturesque whole, to give Italian architecture that charm, which no other style possesses in any similar degree.

A glance at the elevation of the building, which we have shown in the accompanying plate, will be sufficient to give a very clear idea of its general appearance and details.

With the aid of the plan of the principal story, and the following description,

BLOCK OF SIX DWELLINGS.—STYLE: FRANCO-AMERICAN.





the merits of the internal arrangement may be better understood.

The vestibule is divided from the hall, and the hall again from the stair-hall, by columns, as shown on the plan, A, and B. From the stair-hall, a private passage L, leads, to the right, past the dining-room, H, and reception-parlor, D,—which have wide, capacious and lofty doorways—to the kitchen, a room 14×22 feet, I, and to a private stairway, F, leading to the upper portion of the house, with a private entrance from without. The kitchen is provided with suitable cooking-range, sink, &c.

The dining-room, H, an apartment of fine capacity, 18×23 feet, has a recess, square bay-window, or alcove, with sash all the way to the floor; and a balcony, K, in front. From the dining-room, there is an entrance into the pantry, J,

a room 8×12 feet, which is also accessible from the kitchen, I.

The reception-parlor, D, is a spacious apartment, 18×18 feet, with folding doors, leading into the main hall, A, and the private passage-way, L, and two windows on the front, with sash also reaching to the floor of the arcade, P, which extends the whole front of the room. There is a door leading into the boudoir, E, 13×13 feet, which latter has two windows, with a balcony, K, in front of one.

On the other side of the house, M, is the carriage-drive, running up beneath a loggia, or large open balcony. Passing through the main entrance, and through the vestibule into the hall, a wide and lofty pair of doors lead into the drawing-room, C, 17×30 feet, a fine, spacious apartment, having at one end,

a square bay-window with a balcony, K, and on the front, two windows, all of which extend to the floor; with a porch, P, along the front, the whole length of the room. Continuing through the hall, and into the stair-hall, are the main stairs, leading to the upper stories. On the left hand of the stairs, just at their foot, is a door leading into the library, G, a room of pleasing proportions, 19 × 21 feet. This room has on one side, a circular bay with three large windows; and on the back are two, that open on a porch, P, extending the whole length of the room and main hall. This will afford abundance of light, so requisite for a library, an apartment which has now become an indispensable necessity in every American dwelling-house of any extent.

The arrangement of the upper story will be very much that of the floor just described; only, of course, substituting chambers, dressing-rooms, &c. We will not, therefore, give any detailed description of the accommodation beyond the main floor, as such seems unnecessary; for, from a close examination of this plan, it will be readily seen, that there is ample accommodation for the wants of a family consisting of at least ten persons.

The materials of which this dwelling may be constructed, we should recommend to be either stone, or brick with stone dressings. The Western bricks, those of Milwaukee, for instance, are admirably adapted for this purpose, and would have a very beautiful and pleasing effect. Stone, however, on the whole, would be preferable, and wherever it can be obtained at a moderate and at all reasonable rate, should, by all means, be employed.

The probable cost of such an edifice, built throughout in a substantial manner, and fitted with all modern conveniences, would, if erected in the vicinity of Philadelphia, be thirty thousand dollars. Much depends, however, upon the locality, and the facilities that may exist for procuring materials.

The foregoing estimate is based upon the understanding, that the whole of the interior finishing of the principal rooms on the first, or main floor, will be entirely of *hard wood*; and, also, that all the windows throughout will be provided with inside shutters and blinds, to be made in three folds to the jamb, two of which should be pivot-blinds, and the jamb-shutter paneled and moulded: soffits to be formed throughout, to receive them. A plate—representing in detail, the manner in which these inside-shutters are to be made, and the finish within is intended to be executed—has already been given by us; and will be found in our Number II., pages 141, 142 and 143. In another part of the present issue—page —we have given more detailed drawings, in connection with this villa, to which we would draw the reader's attention.

DESIGN FOR A BLOCK

OF

SIX DWELLINGS.

STYLE: FRANCO-AMERICAN.

In presenting this design, our object is to vary, in some degree, the painful monotony of street architecture, in so far as our dwelling-houses are concerned. Continuous ranges of houses, street after street, of almost exactly similar exterior appearance, weary the eye; and any change, which may, at one and the same time, break up this seemingly interminable sameness, and this uniformity—either of which speaks but little for our taste and love of the beautiful—will, we are confident, be fully appreciated. That such a very desirable effect can be produced, by the erection of just such blocks of dwelling-houses, as we are now describing, is undeniable; and as we endeavored to show in our work on "CITY AND SUBURBAN ARCHITECTURE," this can actually be accomplished at a much less expense, if built simultaneously—even taking into consideration additional exterior ornament—than, if

DESIGN FOR A GOTHIC CHURCH.



built separately, after the very plain and unpretending style of the generality of our present houses.

Of course, to carry out this principle, it is requisite, that property owners be brought to see and to understand how, by combination, and by systemizing their operations, they can economize; and, with the amount so saved individually, can erect structures, which, in place of being, as too often now, only eye-sores, utterly unworthy of our age, will tend to beautify and embellish our streets.

It has been truly said, that the grand secret of the improvement of mankind, and of human society in particular, is union and co-operation. To be sure, all we can do is to show, that the application of this co-operative principle to the particular case we have in view, would be productive of immense advantage to our art; and must leave the matter to work its own improvement, which can only really arise, when we become thoroughly alive to the benefits resulting, from the general adoption of our suggestions.

From the Elevation it will be seen, that the intention is, to construct six houses, in connection; each house, eighteen feet front and three stories high, being surmounted by a French roof, making a fourth story. The sky-line is thereby agreeably and effectively diversified by the different heights and breaks of the roof.

The long façade, or face line of the front, is but slightly varied, no projection being more than twelve inches beyond the receding sections, thus dividing the block into compartments, affording opportunities for slight but tasteful decorations, and obtaining what are the great desiderata in architecture, breadth of light and depth of shadow.

Each house has a bay-window in the front, together with a porch to the front door, projecting about the same distance. The form and features of these bay-windows may be different in each, by being made square, circular, or octag-

onal; and, by these means, an effect of pleasing variety will be obtained, considerably to improve the external appearance of the block. The windows, also, are intended to have their heads slightly curved on the outside, but finished square within. The intention is to exhibit the conception of such a block as can be erected at a very moderate cost, and one that would be within the reach, while still meeting the wants, of the major class of the business men of ordinary means.

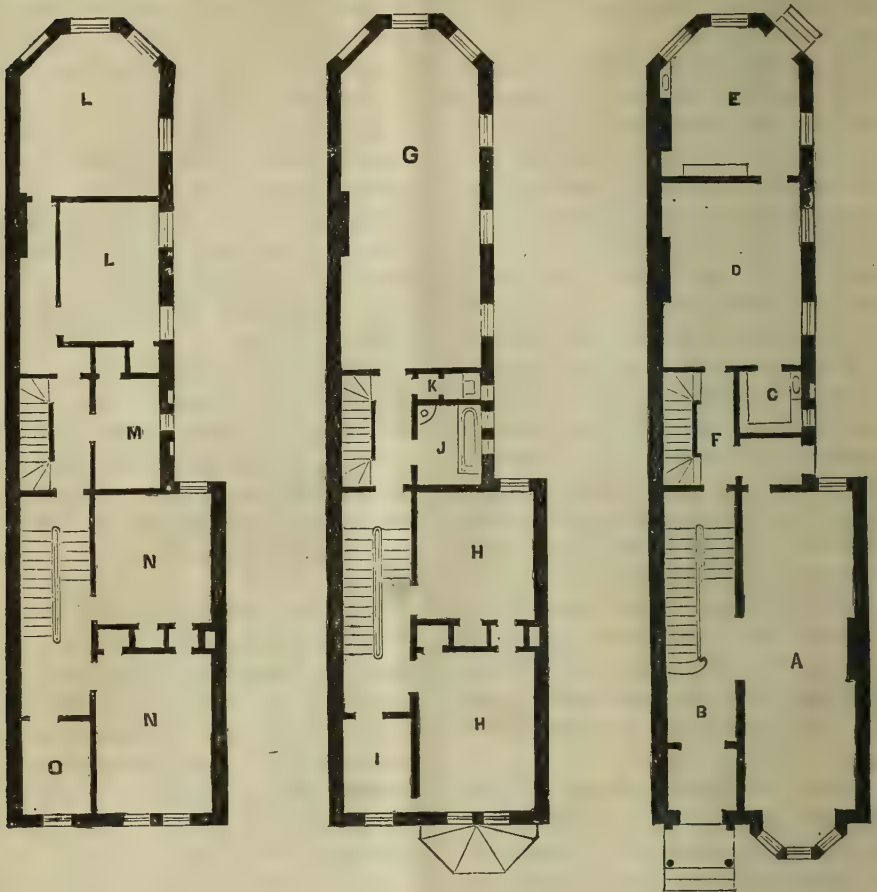
We have given the ground-plans of the first, second, and third stories, a glance at which will clearly indicate all the accommodation allowed, amply sufficient for the comfort and convenience of from six to eight persons, whose domiciles could be thus erected at a very moderate cost.

Beginning with the principal floor:—A is the parlor, 12×28 feet, with a front bay-window. B, the main hall, containing the stairway to the upper portion of the house, with a vestibule on the front. C, the butler's pantry. D, the dining-room, 12×16 feet. E, the kitchen, 12×14 feet. F, the private staircase to the upper stories.

On the second floor, see Fig. 2, the sitting-room, G, is over the kitchen, E, and dining-room D; and is equal in size to both, making it a fine, spacious apartment. Leading out from this room, we enter a passage, from which are doors leading to a bath-room and water-closet. Further on are two communicating chambers, H, H, each 12×14 feet, with closets, and a smaller chamber, I, immediately over the vestibule and main hall. J is the bath-room, and K the water-closet.

On the third story, we have, in front, two chambers, N, N, and a smaller one, O, of exactly the same dimensions and in the same positions as those in the second story. Above the bath-room, we have a store room, M; and, immediately behind, two servants' chambers, L, L. In all, there are eight lodging rooms.

Fig. 2.



The front of this block would present a very pleasing and agreeable effect, if it were constructed of pressed brick, relieved with white marble trimmings, and quoins on the four corners.

DESIGN FOR A GOTHIC CHURCH.

THIS design was originally intended for a Methodist Episcopal Church, near Philadelphia, now being erected, but differing in many material respects from the primary conception.

It is, as will be seen, in the Gothic style of architecture, one peculiarly appropriate for and applicable to ecclesiastical edifices.

The most prominent and striking characteristic of this style is the pointed

arch, hence it is often spoken of under the broad term of Pointed Architecture. Its origin has been a fruitful source for discussion; volumes have been written on the subject; and still it remains an open question.

Some have attributed it to Saracenic origin; others again trace it, by slow degrees, from the corruptions introduced into Grecian architecture by the Romans; more especially from the prevailing use of the arch.

Whatever, though, its origin may have been, it stands unrivalled, as the style of all others, peculiarly adapted to church architecture, combining, as it does, in such a felicitous manner, the beautiful and the simple, the bold and the picturesque. The whole contour of



EXTERIOR DETAILS OF THE ITALIAN VILLA.



its masses exhibits the pictorial; and the characteristic lines of composition, the curved and the aspiring, unite dignity with elegance, while the decorative details supply the indispensable alternations of light and shade; and open out a boundless field for the imagination and artistic science of the artist. We must not, however, here enlarge upon the essential traits and the sublime beauties of Gothic architecture, although it is a theme on which we might be eloquent, as it will be the subject of one of our future articles.

The drawing shows that this fane is intended to have a high roof, and a correspondingly high ceiling. The edifice is entered through the supporting walls of the belfry, in the centre of the front; and, also, through a side porch, as designated, respectively, by the letters A

and J, on the plan. There are, also, two rear entrances, with a passage, as indicated by G and H. From this passage, the class-rooms, E, and F, are entered; one of these communicates with the lecture and school-room I, by a pair of glass doors, and would be well adapted for an infant-school room.

The class-rooms are respectively 12×14 feet, 10×14 feet, and 11×14 feet, the latter being the infant-school room. The lecture or school-room is 25×36 feet, and is also entered from the passage H, at the side porch G. This is a large, lofty, and well-lighted apartment, as will be seen from the plan.

The audience room is 40×65 feet in the clear; and is seated to accommodate four hundred and fifty persons.

From the vestibule, on either side of the main entrance, at A, are two flights

of stairs which lead up to a gallery, extending immediately over the vestibule, the full width of the audience room. The central portion of this gallery will be devoted to the organ and choir.

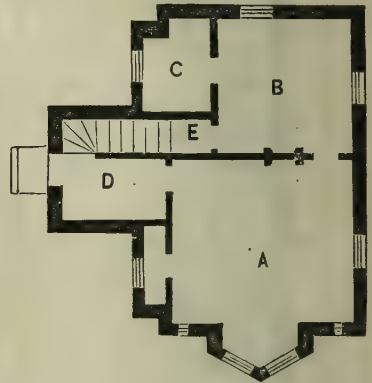
The material proper for the construction of this edifice is stone, cut square, rubble fashion, with the face pointed off to an even surface. The whole of the weatherings, buttresses, caps, window-sills, ring-stones, coping, and kneelers, will be neat hammered work; also the door-sills, steps and platforms. The cost of the construction of such an edifice—if carried out in accordance with the plan and design we have presented, and finished in every respect in an appropriate, plain, but thoroughly substantial manner—would be about thirty thousand dollars. (\$30,000.)

DESIGN FOR A GATE-LODGE,
OR
A SMALL COTTAGE.

WE here present an elevation and ground-plan of a small building which is either adapted for a gate-lodge, or for a small country cottage. In the latter case, we should recommend placing the entrance door, with a porch to front the road, instead of its present position in the engraving, which is more suitable for a gate-lodge, being immediately in front of the entrance gates.

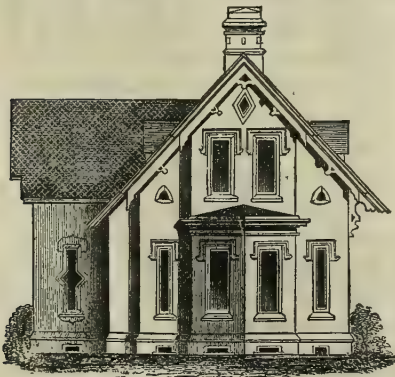
The building—one and a half stories high—possesses very little pretensions to architectural style, but has an air of neatness and comfort, which would make it suitable for a small family of limited means, anxious to own a home, however humble.

Entering the front door, we pass



through a vestibule, D, which contains the stairs to the upper story, and also leads into the living-room, A, 14 × 15 feet, with a bay-window facing the road-front. This room has a closet attached. A door leads into B, the kitchen, 12 × 12 feet, through which we pass into the pantry C, 6 × 8 feet. The height of this story is 8 feet.

In the upper half-story, there will be two chambers immediately over the kitchen and the living-room.





SECTION OF A TWIN-WINDOW FRAME.

GENERAL REMARKS.

THE amazingly rapid increase of vitality, the unparalleled growth, the ever increasing wealth and refinement of the large cities, in every section of our land, and the concomitant greater love and appreciation of the fine arts and readier perception of the beautiful, therein awakened, have aroused a laudable spirit of rivalry and emulation among all classes of our business men. This spirit has, of late years, developed itself, among other ways, in a taste for the enlargement and decoration of their dwellings and places of business; and city seems to vie with city, in the elegance, nay, even magnificence and grandeur, which have been lavished, with unsparing hand, on public or private buildings of all kinds. Thus wealth is circulated, labor is promoted and encouraged, and our cities are embellished with elegant and tasteful structures, of many of which any land might be proud. It has, also, been the happy cause of throwing open to our architects, who have not been backward in availing themselves of these opportunities of exhibiting and exercising their artistic skill, and taste in designing. The eager rivalry in trade, the improved and constantly improving facilities of communication, and the increasing thirst for travel, both foreign and domestic, so evident in the life of the present, have been the means of awakening all our cities to a sense of the vital necessity of applying—both for their own interests and individual, as well as national, reputation—all resources at their command, to render their streets and public buildings as attractive and elegant as possible. To accomplish this end, the architect is, naturally, the one first consulted; and on his good taste, professional knowledge and skill, is mainly dependent the character, whether good, bad, or indifferent, which marks

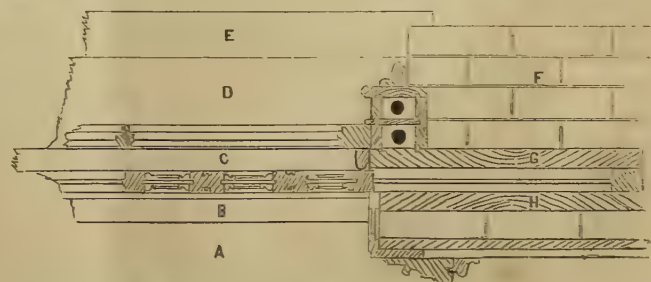
any particular style. If he is master of his profession, and applies himself boldly and independently to his appointed task, aided by a knowledge of the purposes for which the intended edifice is designed, his work is a comparatively easy and a pleasant one. But, on the contrary, if, as is too often the case, he is trammelled and embarrassed by an ambitious or unreasonably exacting employer, then, indeed, the difficulties which he has to surmount or smooth over, cannot be apprehended by any non-professional man. By ambitious, we mean an employer whose whole soul is bent upon the one point of eclipsing his compeers and neighbors, by the erection of a structure, that will totally throw into the shade, as to elegance and magnitude, any then existing dwellings; and by unreasonably exacting, we refer to that spirit of parsimony and illiberality, which strives to attain the object of his ambition, viz.: to excel his neighbors; and, at the same time, begrudges the cost; these traits, as a natural consequence, when persisted in, harass the architect, anxious as he may be to meet the wishes of the employer, and entail upon him much extra labor. We make no mention of the additional unnecessary expense thereby occasioned, which has to be borne by the architect, although this might, perhaps, be taken into consideration. That such a spirit is but too often exhibited, in the dealings between architects and employers, is too patent to be denied or passed over. There may perhaps be an attempt to extenuate by ascribing it to a weakness inherent in human nature; but it is unworthy of the enlightened and liberal age in which we live. We see on all sides, in every land, encouragement and fostering care lavished on all the fine arts, whereof architecture—the chief and the greatest—is that, without

which, they can never flourish, or make the rapid advance which helps to keep a nation great and prosperous. The culture of the fine arts, and a general dissemination of taste for such pursuits are of the highest importance, in a national point of view; for they have a powerful tendency to elevate the standard, not only of intellect, but also of morals; and form one of those mighty levers, which raise nations, as well as individuals, to the highest point in the scale of civilization. In every age, and in every country, the cultivation and encouragement of the fine arts have been invariably attended, as all history goes to prove, with a corresponding improvement in the social, moral, and intellectual character of the people; and the truth of this is never more strikingly and forcibly exemplified, than in the case of our own nation, at the present day. At no former period of our existence, as a nation, have the standards of mental and moral improvement and of refinement and civilization, been more elevated; and at none have the fine arts, in general, and architecture in particular, been more cultivated, more encouraged, and held in higher estimation in our day. We well remember the time, when Philadelphia possessed but two architects; and they had a very limited practice indeed. At that time, there was not one of any note, certainly none whose name ever was known professionally, west of the Allegheny mountains; and there were only three or four in the city of New York. At the present time, we can count in our own city over sixty architects; in New York, one hundred; in Boston, eighty; in Chicago, thirty; and in all our cities, North, East and West, an increase in similar proportion. This fact, of itself, speaks volumes in proof of the increasing, and ever improving taste for architecture, which has sprung up in our midst, within the last few years; and we have only to look around us, in our daily walks, to be assured, that the good work is steadily and

surely progressing; that, in spite of all difficulties, all embarrassments and vexations, our architects are still steadily advancing; disseminating, by the emanations of their genius and their artistic talent, a clearer and more defined perception of, and love for, the beautiful and the true; and a more refined and cultivated taste in the architectural style of our buildings.

The above remarks also apply, with more or less effect, to cities in the old world, as London, Paris, &c. In the two just named, of late years, very marked improvements in the style of architecture are evinced in the beautiful and grand structures of all kinds, that have sprung up, as it were, by magic. Paris is striving to eclipse all other cities; and we must confess, that, as yet, she is far ahead of all in the beauty and lavish elegance and splendor of her public edifices. The prevailing style in that city, and in France generally, as well as in our own country, at the present time, is the Italian, or Palladian, in all the main points below the roof, which is Mansard. The Vicentine style has been described, at considerable length, and in full detail, in another article in this number of our magazine, so it would be needless for us to go over the same ground again at this point. It is our own individual opinion, based upon careful and minute study of our art, and the experience of many years, that this particular style is the one, of all others, most adapted to a prosperous and improving nation, like ourselves, and especially the most suitable, in every way, for our street architecture.

This arises from the fact, that rectangularity of apartments, both in ground-plan, and in longitudinal and transverse sections, is not only best adapted to the demands of business, but also to social needs, such as light, heat, conduction of sound, &c.; whereas, the striking display required in great ecclesiastical interiors is best afforded by the Gothic vault.



WINDOW WITH SLIDING SHUTTERS.

PRACTICAL CARPENTRY & JOINERY.

DETAILS.

FOR THE EXTERIOR

OF THE

ITALIAN VILLA.

A IS a plan of a first-story window, showing the balcony in front. It will have a square head, with brackets. The lower sash of the window is to be so constructed, as to fly up into the head, until it is even with the meeting-rail of the top sash.

B is a section of the same, showing the projection of the balcony, with the bracket.

C is one of the tower-windows, with a circular head, an overhanging canopy and a balcony.

D a section, showing the projections both of the canopy and the balcony of the top and bottom of the window.

E exhibits the second-story window, over the main entrance, also with a balcony. The sash extends to the floor; and will fly up into the head. This window is the most marked feature in the whole front of the design; and calculated to give it a highly elegant and chaste appearance. The heavy pilasters, enriched caps, and segment pediment, with brackets, &c., extending up to the main cornice—and finished with a broken pediment, having an oval window, richly dressed and embellished; all unite to give the exterior of this design an aspect of novelty and elegance, which, at the same time, will not materially enhance the cost of the construction. The window canopy, both permanent and ornamental, as given in the plate, letters C and D, and simple and folding, as often found in striped stuffs with iron frame, is one of the peculiar appliances of this style, and often found

upon other constructions in America, to guard against the powerful summer sun.

F shows one of the second-story windows with pediment-head.

G is a section of the same, showing projection of the pediment-head.

H is a similar window, with a segment pediment-head. This is given in order to vary, as much as possible, the exterior of the building; and to remove any appearance of sameness, that might otherwise prevail.

I is a section of same, showing the projection of the segment pediment-head.

J shows the chimney above the roof of the building.

K is an end view of the chimney.

SECTION

OF A

TWIN-WINDOW FRAME.

We here present a window frame in two divisions, or what is usually termed a twin-window, giving in the cut a plan and elevation, with letters descriptive of the same.

The plan exhibits a horizontal section of the window, with sills, A and B, sash, C, C, and wall, H. The elevation shows a perpendicular section, the centre division, or mullion, having but a single box, K. The two bottom sash, P, and J, and the two top sash, O, and I, are each hung to single weights, J, and K, the latter requiring a pulley for suspending the weight. The cord is secured in the sash, in the usual manner; and passes over the ordinary pulleys in the window-frames. By this method the balancing weight is required to be two-thirds the weight of both sash to which it

is suspended; and the outside poisoning-weights, O and P, which are adjusted in the usual way, and hung in the box, M, will be one-half the weight of the sash to which they are attached. By this centre arrangement is avoided the cumbersome mullion, necessary in constructing the ordinary double-box. The weight, with the pulley, will play just half the distance of the sash;—thus: by raising or lowering the two sash, at the same time, the weight will fall or rise the same distance, corresponding with the movement of the sash in space.

The elevation gives the sash all closed; and the section exposes the position of the weights, in their respective boxes. Thus, L, L, show the boxes containing the weights with pulleys, and F, the parting-bead. N, N, the ordinary side-weights, and G, the parting-bead.

WINDOW WITH SLIDING SHUTTERS.

In the accompanying plate, are exhibited the details of a window, fitted with sliding shutters; the window shown from within the room. A represents the plan; B, the inside sill; C, the sash-casing, with the shutters between B and C; and D is the outside-sill of the window-frame. E is the stone sill; F, the wall; and G and H are the lining on each side of the box for the sliding shutter. I is the panel-back on the elevation of the window-frame. J shows the lower section, out of the box, of one-half of the shutter, which slides each way. K is the upper section, within the box, in the wall; L, the wall, as finished with the architrave and washboard; M, M, the architrave; and N, the washboard, with its top moulding returned up the back of the architrave and forming part of the same. O is the sash; P, the metal way for the sheaves of the upper shutter, and guide for the bottom shutter; R, the wall and vertical section below the sill, with sec-

tion of the panel-back; S, the lintel, with section of architrave and window-frame; T, the inside panel-jamb. U, U, represents the sash on a large scale. V, the iron way in the centre, which is so formed that it will show a bead between the sash; and is rounded, on the top, for the sheaves of upper shutter, and below, for a guide for the lower shutter. A way will also be required on the sill for the sheaves of the bottom shutter.

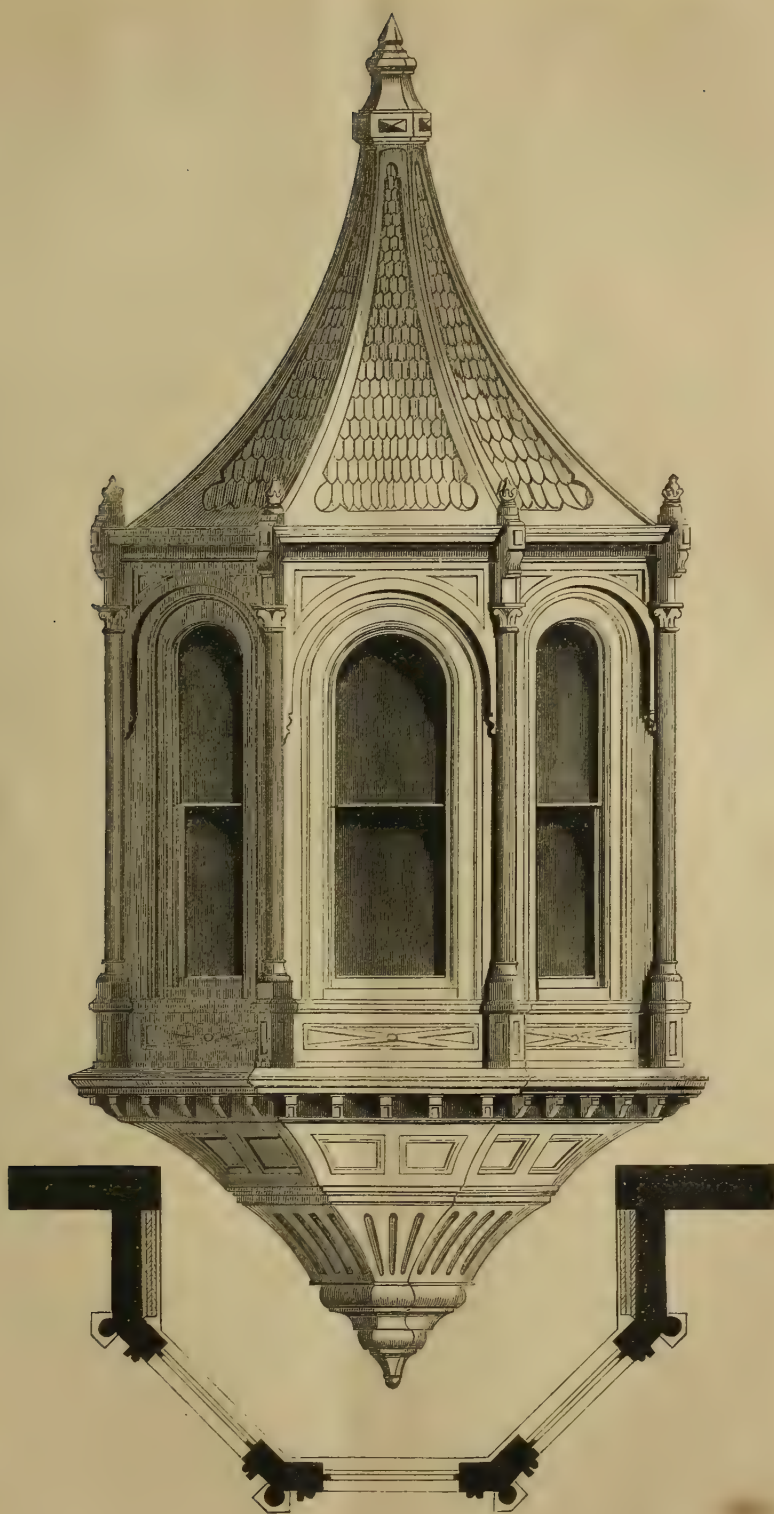
ORIEL WINDOW.

Windows of this description are usually placed on the second story of a building; and, sometimes, extend upwards through two stories. They are necessarily constructed of wood, being suspended as they are to the walls, and projecting out from them a considerable distance. The walls would not be capable of sustaining the weight of such a structure, if it were composed of any other material. The usual mode of supporting and securing these windows, is, to project the joists of the floor out, for the purpose. This is preferable to depending on fastenings in the wall, particularly where the window is large, and the walls are of the ordinary thickness, as is usually the case, in the construction of our moderate-sized houses.

The floor of the Oriel Window should always be level with that of the room within, unless there are obstacles in the way beneath to prevent this finish. When any such exist, and the recess is of small dimensions, it may be raised slightly above the floor of the room. This, however, would be very objectionable, in the case of a large-sized window.

The shutters must necessarily be on the inside. These are so constructed, as—parting in the centre of the window, and folding either way—to close into soffits in the side jambs, as indicated by the ground plan beneath.

Windows of this description vary considerably in their form. Some are



ORIEL WINDOW



octagonal, with openings on three sides; others, again, have but two sides, with two windows; and some are semi-circular. The latter, however, are very seldom met with. There are still other varieties; but the first two we have named above, are those which are in most general use. They are capable of

being made very striking and elegant points in the appearance of a building, proportionally to the amount of decoration, both external and internal, which may be bestowed upon them. The one whereof we have here given a design, is very simple and plain, and can be constructed at a very trifling cost.

THE GAZETTE.

THE MARBLE QUARRY, AT OAKLAND,

CHESTER COUNTY, PENNSYLVANIA.

THE steady increase in wealth and population of our city, brings with it increased wants; and it is important to see, how these wants are to be supplied. Buildings, both public and private, must keep pace; or should rather be in advance of the increasing population; and, in their erection, not only cheapness, but solidity, convenience and taste should be aimed at, particularly as the latter can be obtained with very little extra expenditure, having so many skilful and experienced architects and builders amongst us. Looking round, within the compass of a few miles, we find a country bountifully supplied, by nature, with every material necessary for building purposes, both as regards durability and beauty, suitable for the cottage of the laborer, the more elegant city mansion, or suburban villa, of the merchant, or the more elaborate and massive public edifice. Every order of Grecian, as well as Gothic, architecture can be carried out, in its appropriate style, and in its suitable material.

The Chester valley, extending from the Schuylkill forty or fifty miles west, losing itself in the limestone valleys of Lancaster county, yields marble of all shades, from black and dark blue to nearly pure white, in inexhaustible

quantities. The beautiful green serpentine, the massive granite, the various colored sand-stones, and many other desirable kinds, all being easily accessible; and, indeed, already opened to market, by the different railroads, which, radiating in all directions, offer facilities of which few other cities can boast.

Among the marble deposits, one of the most extensive is that at Oakland—only twenty-seven miles from the city, situated between the Pennsylvania Central and the Chester Valley Railroads, and but a very short distance from either—opened in the year 1833, by Jacobs & Cornog; and now owned by Dr. George Thomas. It was from this quarry, that the marble for building Girard College was, in a great measure, procured—all, in fact, except some of the large blocks, composing the shafts of the columns, and a portion of the steps, &c., which were obtained from Great Barrington, Mass. The Corinthian capitals and other sculptured work were from the Oakland quarries, their marble being well adapted to that purpose, on account of the compactness of its crystallization, thus enabling the artist to cut it into any desired form, and closely resembling, in that respect, the Italian statuary marble.

The quarry measures 120 feet long by 60 feet in width, and in depth 100 feet, being 75 feet below the water level. There are two distinct veins, running from N. E. to S. W., dipping at an angle of about 45 degrees, lying in beds of from 8 to 12 feet in thickness, to the depth of 50 or 60 feet. Below that depth, the marble occurs, seemingly, in a solid mass, requiring side picking to get out blocks, which can thus be procured of almost any size. The North vein is 30 feet in width, is of a pale bluish white; the other, lying south, and separated by a narrow strip of limestone, being in width 26 feet, is nearly pure white, with a faint bluish tinge. The rock stratification at this place is quite an interesting geological study; there having been a seeming upheaval, covering an area of some 6 to 8 acres, 20 to 22 feet above the surrounding surface, the mound, or plateau, being composed of different shades of marble, from dark blue and black to nearly pure white, in alternate veins. South of this manifestation and lying on, and contiguous to, the black, is found a considerable deposit of Hematite, or sesqui-oxide of iron, with large masses of a bluish clay, containing plumbago in small quantities, running into the slate, which bounds the Chester valley on the south.

These quarries were worked, successfully, for eleven years, or, until the completion of the College, in 1844, during which time were built—the Preston Retreat, on Hamilton street, a Lying-in-Hospital, now in a flourishing condition, and fully carrying out the designs of its benevolent founder,—the noble mansion of the late Matthew Newkirk, Esq., at the corner of Thirteenth and Arch streets, and the classic edifice in West Chester, Chester county, erected in 1836, under the superintendence of Thomas U. Walter, Esq.,* by

the Bank of Chester county, now the National Bank of Chester county. The last-named edifice is perhaps the most beautiful and correct specimen of the Grecian Doric in the United States, being an exact copy of the Agora, at Athens; and is now in as perfect state of preservation as when first built. Indeed the stone stands the exposure of years without the least appearance of crumbling, or disintegration; and retains its color perfectly, without stain or blemish, proving that our changeable climate, with its extremes of temperature, does not in the least affect it. That it does affect much of the marble and other kinds of stone in this country, is demonstrated by many of our buildings. The facts are, that its analysis shows no Talc, and but little earthy matter; that it is composed of nearly pure carbonate of lime, with considerable silex; and that, although hard to work, it finishes smoothly. These characteristics render it more enduring for monumental purposes. The specimens in our cemeteries here, as well as through the South, prove it well adapted for necropolitan adornment.

Abandoned, on account of the difficulty and cost of sizing the blocks, and of getting the marble to market—there being neither railroad facilities, nor the means of sawing as at present—the quarry lay dormant for twenty-three years, till, in March, 1867, it was reopened by the Messrs. Thomas,* who have made a connection with the Chester Valley Railroad; and having erected a mill, with ample steam-power, can, by working both veins, supply to stone-cutters and builders the different kinds of stock it affords, with equal facility and promptitude.

The dark blue marble shows to much advantage, in the rural districts; is well adapted to villas, near cities, and

* Architect of Girard College; and of the extension of the College at Washington, D. C.

* J. Preston Thomas and George Thomas, Jr., operating as Thomas Brothers, West Whiteland P. O., Chester county, Pennsylvania.

quite desirable for churches, and private residences in country towns. The elegant and commodious Banking House, with United States Post Office attached, erected the past season, by Kirk McVeigh & Co., Bankers, West Chester, Pa.,—showing the natural fracture, untouched by the chisel, except on the

corners, and in the door and window trimmings, which are chisel-dressed—is a happy instance of its use, harmonizing well with surrounding objects; and leaving a pleasant impression on the mind, as works of fine taste and good execution invariably do.

PENN TREATY-GROUND.

WE are happy to learn, through the subjoined letter of our genial and public-spirited friend, Mr. Gordon, whose untiring efforts with respect to raising funds for the statue of Washington have been crowned with such eminent success, that at least one citizen—and there are myriads, if one—shares our feelings in regard to the Penn Treaty-Ground.

In addition we have, relative to our late presentation of the subject, the interesting points kindly presented by Mr. Richards.

PHILADELPHIA, PA.,
August 6th, 1868.

EDITORS OF SLOAN'S
ARCHITECTURAL REVIEW
AND
BUILDERS' JOURNAL.

GENTLEMEN:

The public-spirited citizens of Philadelphia are indebted to you, for once more taking the initiative in the matter of a MONUMENT TO PENNSYLVANIA'S FOUNDER—WILLIAM PENN. It speaks well for the spirit and ability which is to preside over your new periodical, that the first number should contain an article, from the able and cultivated pen of its Assistant Editor, Mr. Charles J. Lukens, so full and complete, and illustrated so minutely with maps, and actual measurements, relative to the PENN TREATY GROUND, within the limits of our metropolitan Philadelphia.

Is it not high time that the architectural wisdom and commercial pride of our

citizens should mark the spot, so "beautiful for situation," on the bank of the Delaware; and enclose the very site of *the old Elm Tree in a river square*, as a breathing spot, for all time; from whose centre will rise in memorial beauty, with all the graces of architecture clustering around it, THE MONUMENT OF WILLIAM PENN?

We have had talk enough. Now let those who are in earnest *organize!* No matter how few. There is much to be done; and time flies. My own experience in connection with the Washington Statue—which the Public Schools will finish next year; and which will be the first public statue erected in this city—has taught me much with regard to the management of such affairs.

Various plans might be here suggested; but all suggestions, ideas and plans, are secondary to practical work.

The first thing is organization. Even then, there are years of work before us.

If indeed our strange city should be seized with one of its spasmodic fits, a monument to its Founder would be quickly erected. There are humanitogeological strata to be dug through. The whole public influence of the Quakers, or Friends, is opposed to monument-building. The people of the world are pre-occupied; and the people of the church feel they must first attend to higher things. We are young in such matters; and even those who favor such developments of art and national memories, have been so greatly discouraged

by the efforts in this direction—baffled oft and long—that the noble and patriotic spirit of the people is deadened.

What Americans do, must be done quickly. Let us organize; procure a charter; and go to work! What say you?

Yours, for Monumental History,
GEORGE F. GORDON.

PHILADELPHIA, PA.,
August 27th, 1868.
No. 240 South Fifth street.

CHARLES J. LUKENS, Esq.

DEAR SIR:

The corvette Kensington was partially owned by my late father, Mark Richards; and, owing to the inability of the Mexican Government to pay for her, the vessel was so long at the wharf, that some of her timbers rotted, and she underwent extensive repairs.

I have been aboard of her several times; and her make, equipments, and general appurtenances were worthy of

the eminent mechanics by whom she was launched.

Horace Marshall, of Virginia, formerly a merchant of Fredericksburg, a long-tried friend of my father, was sent to the Dey of Algiers, to offer the vessel; but this gentleman—who was the nephew of Chief Justice Marshall—never returned, the ship being supposed to have foundered at sea; and then—after waiting a long time—the vessel was, through the intervention of Baron Krudener, then the representative of the imperial government, sold to Russia for \$200,000.

Beyond cavil, she was a magnificent little man-of-war, thoroughly adapted to her object, and yet apparently better fitted for a pleasure yacht. She, literally,

“Walked the waters, like a thing of life.”

This in satisfaction of your late request.

Very respectfully yours,

G. W. RICHARDS.

THE WANTS OF WEST PHILADELPHIA.

A MPLE drainage is now needed in West Philadelphia: the whole of that part of the city south of Market street, and as far west as Thirty-eighth, is without a culvert, the water finding its way to the Schuylkill, through trunks, under cellars and streets, and by the tortuous windings of some old water-course. The great improvements now being made, from Thirty-second to Thirty-fifth, and from Chestnut to Walnut street, have no sewers wherewith to connect the drainage. We understand, that Walnut street, from Thirty-second to Thirty-fourth, was vacated for the city, and a petition for a sewer therein granted by Councils, some time ago. Why is it not commenced, and the street graded and put in condition at once, so it can be paved before cold weather? What is the reason the city does not grade and pave Woodland street, from Market street south to Woodland Cemetery, as authorized to do by act of Assembly? The rapid growth of the Twenty-fourth Ward demands it at once.

Water-pipes, in all those streets where improvements are making, should be laid at once, so that parties can finish grading, and pave before cold weather.

Great complaint is made by builders, in the Twenty-fourth Ward, that they are met, in every City Department, with delays and obstacles to important city improvements. One party that we know, is actually grading streets at his own expense, because it is impossible to get city officials to do their duty.

West Philadelphia is to-day the most rapidly improving section of our city. Beautiful and costly residences are springing up, as if by magic. Good sewers, water-pipes, gas-pipes, grading, curbing, and paving, are absolute necessities, and now, instead of red-tapism throwing obstacles in the way of this great expansion, destined to swell the revenues of the city, it behooves every Councilman and city official to assist the projectors of these great enterprises in the full and rapid completion of all belonging to the best finished streets. B.

The following authentic and valuable TABLE has been very obligingly furnished us by BENJAMIN H. SHOEMAKER, Esq., Importer and Manufacturer of Window Glass, Nos. 205 and 207 North Fourth Street, Philadelphia.—Eds.

NUMBER OF LIGHTS WINDOW GLASS IN A BOX OF 50 FEET.

6x 8 150	10x22 33	12x20 30	14x24 15	18x22 18	22x24 14	26x40 7	30x56 4
7x 9 115	10x24 30	12x22 27	14x26 14	18x24 17	22x26 13	26x42 7	30x60 4
8x10 90	10x26 28	12x24 25	14x40 12	18x26 15	22x28 12	26x44 6	32x42 5
8x11 82	10x28 26	12x26 23	14x44 11	18x28 14	22x30 11	26x48 6	32x44 5
8x12 75	10x30 24	12x28 21	15x18 27	18x30 13	22x32 10	26x50 6	32x46 5
8x13 70	10x32 22	12x30 20	15x20 24	18x32 13	22x34 10	26x54 5	32x48 5
8x14 64	10x34 21	12x32 18	15x22 22	18x34 12	22x36 9	26x58 5	32x50 4
8x15 60	11x13 51	12x34 17	15x24 20	18x36 11	22x38 9	28x30 9	32x54 4
8x16 55	11x14 47	13x14 40	15x26 18	18x38 11	22x40 8	28x32 8	32x56 4
9x11 73	11x15 44	13x16 35	15x28 17	18x40 10	22x44 8	28x34 8	32x60 4
9x12 67	11x16 41	13x18 31	15x30 16	18x44 9	22x46 7	28x36 7	34x40 5
9x13 62	11x17 39	13x20 28	15x32 15	20x22 16	22x50 7	28x38 7	34x44 5
9x14 57	11x18 37	13x22 25	16x18 25	20x24 15	24x38 11	28x40 6	34x46 5
9x15 53	11x20 33	13x24 23	16x20 23	20x26 14	24x30 10	28x44 6	34x50 4
9x16 50	11x22 30	13x26 21	16x22 21	20x28 13	24x32 9	28x46 6	34x52 4
9x17 47	11x24 27	13x28 19	16x24 19	20x30 12	24x36 8	28x50 5	34x56 4
9x18 44	11x26 25	13x30 18	16x26 17	20x32 11	24x40 8	28x52 5	36x44 5
9x20 40	11x28 23	14x16 32	16x28 16	20x34 11	24x44 7	28x56 4	36x50 4
10x12 60	11x30 21	14x18 29	16x30 15	20x36 10	24x46 7	30x38 7	36x56 4
10x13 56	11x32 20	14x20 26	16x32 14	20x38 9	24x48 6	30x40 6	36x60 3
10x14 52	11x34 19	14x22 24	16x34 13	20x40 9	24x50 6	30x42 6	36x64 3
10x15 48	12x14 43	14x24 22	16x36 12	20x44 8	24x54 5	30x44 5	40x60 3
10x16 45	12x15 40	14x26 20	16x38 12	20x46 8	24x56 5	30x46 5	These
10x17 42	12x16 38	14x28 18	16x40 11	20x48 8	26x32 9	30x48 5	dimen-
10x18 40	12x17 35	14x30 17	16x44 10	20x50 7	26x34 8	30x50 5	sions in
10x20 36	12x18 33	14x32 16	18x20 20	20x60 6	26x36 8	30x54 4	inches.

THICKNESS OF HAMMERED PLATE GLASS, AND WEIGHT PER SQUARE FOOT.

Hammered or Rough Glass, 1 inch thick for Floors, 13½ pounds per square foot.

do.	do.	do.	¾	do.	do.	9¼	do.	do.
do.	do.	do.	½	do.	Skylights,	7	do.	do.
do.	do.	do.	⅜	do.	do.	5½	do.	do.
do.	do.	do.	¼	do.	do.	3¼	do.	do.

Fluted or Ribbed Glass, ½, ⅜ and ¼ inch thick, weigh the same per square foot as same thickness of Hammered Plates. 3-16 inch Fluted weighs 2½ pounds per foot.

Polished Plate, for Windows, averages one-quarter of an inch in thickness, weighs 3½ pounds per foot, and is made in plates 9 feet wide and 20 feet long.

Hammered Glass, for Floors, is made 5 feet by 8 feet; the ½ and ⅜ inch for Skylights as large as 6 by 10 feet; the ¼ inch Rough and 3-16 inch Ribbed, in sheets 2 to 3 feet wide.

NECESSITY FOR THE MUTUAL CONFORMITY OF HOUSES AND FURNITURE.

BY GEORGE J. HENKELS.*

THE easy communication with Europe—together with the desire for travel, which appears to be national with Americans—has improved our taste, both in furniture and architecture. The old cities of Europe abound with objects of interest to Americans, from the grand old cathedrals and churches, with their renowned paintings and sculpture, embodying the genius of Raphael, Michael Angelo and other celebrities of past ages; their palaces, adorned with a munificence of expense, which we can copy, but, for cost's sake, dare not excel; and the grand architecture of the buildings to be admired, by generations yet unborn, for their beauty of design and solidity of workmanship.

The furniture of the mediæval ages, ornate in conception and in carving, was, in the time of Louis XIV., enriched with elegant designs in porcelain, and often even with solid ornaments of gold and silver. In those days, when the monarch was absolute master of the people, the amount of labor bestowed on buildings and furniture was of no moment, as the artisan was forced to be content with just enough wages for the most miserable sustenance.

In America, where the artisan is a part of the government, and by his vote can neutralize that of the most wealthy or influential citizen, who may wish to legislate contrary to either the artisan's interest or his wishes, we would cut a sorry figure in attempting to erect such monuments of art, as St. Peter's at Rome, the Cathedral at Cologne, and others of almost equal celebrity, which

have been constructed within the past thousand years.

Even these works of Christianity appal us with the magnitude of the labor expended upon them; and how much less can we comprehend the system of labor that enabled the pagan kings and emperors to erect such stupendous works as the Great Wall of China, the grand temples, (the ruins of which attest their former magnificence,) and the Pyramids of Egypt, erected by the Pharaohs whose mummied remains declare that their physical construction was not superior to our own.

Even now, in the nineteenth century, the boasted era of enlightenment, when "*Aspiring men would be angels, and angels would be gods,*" we, with all our scientific knowledge and enlarged ideas of mechanical power and construction, could not, by the combined power of the whole world, raise one of the large stones and place it on the Pyramid of Cheops as we there see them. Aye! and we even have no mechanical appliances, that could remove them from their present position. We know of no means of transportation for the immense solid marble columns, that formerly supported the grand temple of Karnac on the Nile. We could not even remove them from the quarry whence they were obtained, much less transport them nearly four hundred miles, as was done in their case. The contemplation of the magnitude of such ancient and principally heathen works of labor and art is a profitable occupation for the scientific and mechanical part of our

* Cabinet and Upholstery Warerooms, N. W. corner of Thirteenth and Chestnut streets, Philadelphia.

citizens, who, in speaking of our great progress in science, mechanics and invention, are apt to assume, that we are far superior to all who have preceded us. We are on the lowest rounds of the ladder of science, whose topmost has been reached thousands of years past. But we are progressing; and have the advantage over the ancients, as we have their master-pieces for models, whilst, with them, it was original conception.

In ancient times a particular characteristic architecture pervaded the whole design of a building. The most general was Grecian, Roman and Gothic, and if it was intended to erect a building in either of these styles—the architect was strict in having no intrusion of any other. In modern times, we make a combination, with good effect; as is seen in many of our public buildings such as the Girard Bank, the Custom House and Girard College, in Philadelphia.

As a general rule, the architecture of our houses is of an *indescribable order*, or disorder, for which it will be necessary, some time, to coin a name. The builder, be he a carpenter, bricklayer, or stone-mason, makes a contract to build a house; with certain specifications as to size of front building; with such and such back buildings; height of ceiling in each story; and such kind of materials to be used. The stone-mason is the architect for the foundation; the bricklayer, for the walls; and the carpenter and the plasterers for their part; with the general superintendence of the contractor for the whole. The consequence is, that a *comfortable looking inconvenient* house is the result. In building such a house, a bricklayer would be considered a fool, if he built up solid walls; and left the carpenter to cut holes through, for windows and doors; but things equally inconsistent are being continually done, when there is no regular architect employed. Our house architecture is essentially too monotonous in the parts of use. That is, three

or four-storied brick fronts, with white marble window and door-sills and lintels. Three-story back buildings, extending almost to the next street, leaving a very small square yard at the rear end of the lot and a long, damp, narrow side-yard, of four to six feet in width, the length of the back building. Thus, row after row is put up in pairs, two back buildings facing each other, with two narrow yards, separated by an eight or ten foot fence, exposing the domestic operations of each family to the other, even though there may be no disposition, in the case of either party, to be inquisitive. The close contiguity of the second-story back—which is almost always the family sitting-room—makes it nearly impossible, to avoid seeing what is going on in the next house.* There is no other city in the nation, that has so persistently adhered to this plan of building as Philadelphia. Besides the above-mentioned inconveniences, are the distance from the front door to the various stories in the back-building, and the fact that the most desirable part of the house is taken for a parlor, which is the least used of any part of a Philadelphia home.

With an eastern and western exposure, the sun will in summer dry up the moisture in the narrow side-yards; but with a northern exposure, there is but little chance for the sun to operate; and the consequence is green mould (a growth of poisonous fungi) on the wall and brick pavement, much to the injury of the health of the occupants. This occurs to some extent, in the southern exposure; but we have become so accustomed to this, that a damp, unpleasant smell is noticed, but no attempt made to remedy it.

* This is correct. But, singularly enough, we have known instances, where—by mutual understanding, both between families who did, and those who did not visit—the blinds of the two confronting sitting-rooms were always kept raised and opened in the evening, and the gas lighted, for sociability and security between the women-folk of the two houses, the men being often absent.—Ed.

In the city of Philadelphia, where room is so abundant—with such easy communication with the suburbs, where ground is plenty and cheap—we should have at least the greater part of our new houses put up on a lot sufficiently broad to admit of a wide hall, in the centre, on each floor, permitting a free circulation of fresh air, at all times, through the house; and allowing the sun to play freely on the walls and pavements, thus effectually preventing the accumulation of green mould, at any time.

A lot for a double house, with a yard the full width of the house, does not contain any more superficial feet, than that for a single house; and is infinitely preferable.

Our finish for the interior of our houses is also monotonous, the same as the exterior, if not worse. In the exterior, we have the relief of white marble, granite, Pictou stone, brown stone and mastic for variety, which, by a little ornamentation, relieves the sameness but in the interior, Philadelphia houses are almost all alike. That is, a long, narrow hall, with the main stairway at the apparent end of it; two doors opening into the parlor, cutting its blank wall into sections, with the doors opening back to the wall, leaving no place for furniture when the door is open wide; and an ugly blank, when the door is closed. On the other side of the parlor, one or two marble mantels which occupy a great part of the wall. In front there are two windows; in the rear usually one, opening on the narrow side-yard. Around these windows the carpenter has attached enormous mouldings—sometimes twelve inches wide—thinking, no doubt, that he is making an elegant job; and that the room, as from his hand, is really finished, not knowing that the cabinet-maker is obliged to spoil the proportion of the furniture, to enable him to avoid those same mouldings; and, that the upholsterer is also obliged to mar the shape of his cornices

and drapery, in trying to hide, with the curtains all the wood, which the carpenter had so much trouble to put up.

Where drapery is to be hung, the less woodwork there is around the windows, the better the upholsterer can work; and the more graceful the folds of the curtains. A bead three-quarters of an inch to one inch wide, to protect the corner of the plaster, is all that is required. After all, what is the use of the immense frames and mouldings around the doors, unless it is intended to benefit painters, and entail a great amount of extra labor on the domestics? A narrow wood protection for the plaster, with a frescoed panel down the sides and an ornament of some pretty design, in fresco over the door and window-heads, would certainly be more graceful. In plain houses the paper-hanger could accomplish the same effect at a very small expense.

Again, what is the necessity for cumbering the parlor with immense marble mantels, where the house is heated with hot air or steam. But it is the fashion to have mantels, with a mirror on top of them, reaching to the ceiling; the height of the mantel just allowing a person to see his or her face in the mirror—with all of the upper part serving only to reflect the ceiling all awry, as is the usual case. Why not stud the wall out to the chimney jamb, and have no mantel, but only an ornamental heat-register or low-down grate; and reserve the walls for mirrors to the floor; and for furniture and paintings. The amount expended in useless wood-work around windows and doors, likewise in marble mantels, would nearly furnish the window drapery and long mirrors.

The writer, called in, not long since, to furnish a house, was made painfully aware of another one of our monotonies. The house was all doors, there actually being no place for furniture, unless doors were closed up. In fact, the bricklayer and carpenter had made a most convenient house for com-

munication, but not adapted for either comfort, convenience or beauty in furnishing. When a gentleman builds a house for a permanent home, he should first consult the architect, for plans; and refer the architect to some responsible cabinet-maker for a consultation to arrange spaces for the various articles required in a well-furnished house. This can all be done, without interfering in the least with the architect's plans, or the owner's desire. The moving of a door or the arrangement of a pier, so as to accommodate the proper articles of furniture, may not serve to render the room so handsome *unfurnished*; but when the proper articles are put in their places, the effect is much better, as a whole, than if the cabinet-maker and upholsterer were restricted—

"Cribbed, cabined and confined—"

in the proportion of their parts. When the interior of a room is planned, it is as easy to arrange for the necessary articles of furniture, and a proper convenient place for each, as it is to do all by hazard.

Whatever assists to make a home cheerful should be of paramount importance, as the tone, whether cheerful or gloomy, is, to a great extent, the reflex of its surroundings.

There are many other *inherited* faults in our house architecture, which if dilated on, would unduly protract this article; but enough has been said, to expose prominent faults, and the good sense of the reader will no doubt suggest reforms in other secondary ones.

BUILDING APPLIANCES.

IT is strange, that there has been so little added, for ages past, to the necessary facilities for the construction of buildings. The scaffolding used by masons and bricklayers is the same rude contrivance to-day, that it was in far distant time. We see, by the early wood-engravings, still extant, that this was the case. The hod, too, is no better than its earliest predecessor. In fact, the various tools are still retained, as of yore; and human invention and art improvement, in such matters, seem to stand still, in deference to the antique ideas, which have so thoroughly established pre-emption rights in the field referred to.

Now and then, it is true, some adventurous spirit presumes to try an improvement in some one thing. For instance, some forty years ago, a London master builder, at a great expense, had fitted up for himself a scaffolding, so constructed, as to be capable of being drawn out, in the legs, like the joints of

a telescope, and thus he elevated his scaffold tier by tier as he required it. Nobody took the hint; and whether the poor inventor profited by his novel arrangement, or died in despair, history sayeth not. Some few efforts were made to introduce the telescope joint in interior scaffolding, however; and Mr. Byfield, the eminent artist in *papiere maché* ornamentation for ceilings, actually used such a contrivance with success. It has since been used by fresco painters; and always found to be a great improvement on the detestable system of "horser

The method of bracket-scaffolding, by means of triangular brackets secured by pins to putlocks, in the walls, is sometimes used; but it is very dangerous, as well as injurious to the green work it bears upon.

The fact is, that this matter of scaffolding is a thing too little thought about; and wherefore such neglect, we are at a loss to know. A master builder, expect-

ing to continue in business for a fair number of years, ought surely to have a well-devised, convenient, substantial and safe establishment of this sort. He would find in the end, that it is economical, as well as philanthropic; and that artisans would give him a preference, as an employer, having some regard for their lives and their limbs—rather than the selfish man, who looked alone to his pocket and his profit.

We are led to speak of this subject, by observing that an improvement in the way of hod-carrying, &c., is now in actual operation, on Broadway, New York, whereby a small steam-engine, on the ground floor, works a hoistway, carrying up a number of hods of brick or mortar to the story, at which the men are at work; and even carrying up the men themselves, getting rid of the ladder system, which is a decided improvement on an antiquated nuisance.

This new hoisting apparatus is extremely simple, being worked by a rope passing round a pulley, up aloft; and

drawing up a platform, which runs on elevated side pieces or guides. This platform is furnished with a contrivance to rest the hods against while *in transitu*. The hoistway is contrived by simply leaving the necessary space, in each floor, through temporarily omitting some joists, and securing the guides all the way up.

We would suggest the use of a double hoisting apparatus, worked with an endless rope, by which the descending platform may help raise the ascending one, and thus, by a reciprocal system, more than double the advantages be gained, by this most desirable addition to the too meagre facilities for building.

We trust that the MANHATTAN HOISTING MACHINE COMPANY may succeed in making this adventure as successful as it well deserves to be; and that other departments of the great art of construction may at last awaken to some sense of the necessity for a general advance, and an improvement in details.

THE NEW SUBSTITUTE FOR SILVER.—Minargent, recently invented in Paris, and which may be compared to silver, possesses, according to the *London Mining Journal*, nine-tenths of its whiteness, malleability, ductility, tenacity, sonorousness, and density, while it has a superior metallic lustre, wears better, is less liable to be acted on by the emanations of sulphuretted hydrogen, and is less fusible than silver. Minargent may be used for all purposes to which silver or other white metals or alloys are applicable. It is composed of one thousand parts of pure copper, seven hundred parts of pure nickel, fifty parts of pure tungsten, ten parts of pure aluminum. The inventors do not, however, limit themselves to the exact proportions given. The chief features of the minargent consist in the

introduction in the alloy of pure tungsten and pure aluminum, and also the considerable proportion of nickel which they have succeeded in alloying with the aluminum. The metal is formed into ingots, and moulded in sand in the ordinary way.

MR. KERR, of Edinburgh, has invented a reflector for a locomotive, by the means of which the engineer is able to see the rear of his train, the conductor and all who are either getting on or off, without moving from his seat. It can be arranged for any length of train by simply changing the angle of reflection. It has been tried on the Jeffersonville road, and pronounced to be a success in every respect.

SYMBOLICAL COLORING.

IN presenting a slight abstract of SYMBOLICAL COLORING, amounting, indeed, to scarcely more than a hint, it is necessary to premise: that, from its very nature, no subject is so prone to fall into abeyance or disuse. Its representations are, in one sense, pictures; yet, if not absolutely bound down to mere symbolical work, men soon acquire facility in executing and skill in judging pictures, which, in carrying art onwards to true representation, have the direct tendency, at first, to confuse, and finally to destroy any symbolical import in coloring.

Were symbolical designs to be kept merely flat, something in the style of the Egyptian painted hieroglyphics, this subversive trend might be averted, as the nation capable of executing works of high art would also be capable of dashing off the ruder outlines of symbolic art, and the two kinds could not possibly be confounded.

Many abbreviated styles exist in the papyrus rolls, and a few upon the monuments, of ancient Egypt; but, in the full symbolically painted hieroglyphics of the antique Copts, mostly found in the interiors of temples, or upon the walls of royal tombs—apart from their phonetic power as letters, to decipher which requires a knowledge, both of the ancient Coptic, and of the method of the Champollionists, to say nothing of the arbitrary rules governing the painter-scribe;—we find, that, even if the general drawing has a stiffness referable to the infancy of pictorial art, yet that stiffness is the stiffness of convention, and does not really bound the national powers. The complexion and features of the natives of different countries, prisoners of war; the form and color of the strange beasts; the shape, markings and hues of the foreign fruits of the earth; are all given with a minute-

ness of detail, with an unmistakable exactitude of resemblance, proving that while ancient Mtsr, or Misr,—the land of Mizraim, son of Ham*—abounded in good artists, they remained, generation after generation of them undeveloped, because their country only needed them as sacred scribes. And in fact the ancient Egyptians used the same word *skhai*, for writer, painter† and sculptor. On the other hand, the men and women, the domestic animals, the implements and the indigenous fruits of Egypt were presented in a short-hand style, much resembling the best efforts of the western Indians, upon the flesh side of favorite bison-robcs, or the first attempts of our own juveniles, with crayon, chalk, charcoal, or whatever may come handy, upon books, wall-paper, or board fences. For both practices the reason is obvious. They were particular about the unusual, the remote, the foreign and the strange, because concerning these it was desirable to give an exact idea to their own people; they were conventional, careless and rapid about persons, animals and things Egyptian, because all their own people knew all about these. Whether elaborating or hurrying, they always drew in profile, except that they squared to the front the shoulders of men and women, and they do not appear to have known any thing of the art of foreshortening. But,—as they depicted nature only for the purpose of obtaining, either symbols or phonetic letters—the rules of perspective, whether linear or aerial, were not needed. Had they been, such good geometricians, as the primeval Copts, would soon have

* From whom all Egypt was by the ancient Copts called Khem.

† Including draughtsman. *Skhai* signified, as well, to write, to draw, to paint and to carve; also writings, drawings, paintings and carvings or sculpture.

discovered them. That they were not depicting nature, except in a designatory manner, will conclusively appear from this fact: they always colored Egyptian males pure vermilion and Egyptian females pure yellow, the latter pigment not being absolutely identified. The discoveries and expositions of Champollion *le Jeune* and his disciples being over forty years old, and published thirty-five years ago, the general world might be supposed to have settled upon the fact, that the ancient Egyptians, or primitive Copts, were high-featured Caucasians of the family of Ham. But—however some, preferring to believe the Copts, ages before Greece and Rome were dreamed of, wrote their phonetic hieroglyphics to be all symbolically rendered into Greek and Latin, thus siding with the puerilities of Kircher, against the consistent common sense renderings of Champollion—one point is certain, whether the original Copts were white or black—and they were Noachian, of the same general blood as ourselves—in no nation that ever existed, were all the men and boys bright red and all the women and girls bright yellow. These colors were arbitrary; and only given to the effigies of natives, in order that they might be known at sight.

Coeval with the earliest antiquity, the history of symbolic colors is most obscure. Yet we find that colors had much the same symbolical signification amongst all the primeval nations; although it does not follow that this original uniformity has continued. This, primary coincidence of meaning, points to a common origin in the earliest condition of the human race, the science being developed to the fullest extent in the religion of ancient Persia, wherein were the two principles of good and evil, or Ormuzd and Ahriman. These were typified respectively by white and black, which, according to the lore of the ancients, were the only two colors, whence all others were derived. Modern science

does not allow either of these to be a color at all, making white the combined reflection, and black the combined absorption, of all the three primitive colors, red, yellow and blue.

The symbolism of colors, thus intimately connected with religion, passed into India, China, Egypt, Greece and Rome; and, after a prolonged lapse, reappeared through Western Europe in the middle ages; so that the gorgeous windows of the Gothic cathedrals probably found their truest explanation in the Zendavesta, the Vedas; and the sacred books and paintings of the Egyptians. Contrary to the practice of most of the other priesthoods of antiquity, the Coptic hierarchy prohibited carvers, sculptors or metal-workers, from representing their divinities, lest they should depart from the symbolic rules.

It was death in ancient Rome, to sell or be clothed in a purple fabric. Similarly in China, now, the individual, who wears, or purchases, clothes bearing the prohibited symbol of the dragon, or of the phoenix, is liable to three hundred stripes, and banishment for three years.

Symbolism is responsible for this harshness of customs and laws. As a political, or a religious idea belonged to every pattern and every color, to alter or change it, was wantonly to cause confusion, besides committing the crime of rebellion, or of apostasy.

All, who have paid the slightest attention to the progress of pictorial art, are well aware, that East Indian, Egyptian and Etruscan paintings are composed of outlines simply filled in, flat, with brilliant unmixed tints. The pattern and the color had each an arbitrary, a necessary signification. Such art, symbolic art, was radically restrictive; and could not have aught to do with perspective, chiaroscuro and demi-tints.

When mediæval Christianity called to her aid this long-disused, but ever agreeable symbolism; and, in the stained glass of her churches and minsters, gave it a more gorgeous existence than ever

before or since; she fairly typified her own essence in the jewel-like ornaments of her impressive fanes. She had manifested buried truth and beauty, as her HEAD had manifested GOD'S love for the world, never failing; but sorely obscured by the crimes and traditions of men.

The speech of the rainbow, apart from the promise of its sweeping entirety, although always of the same nature and generally of the same import, has had a number of dialects. Three of these tint-tongues constitute its European manifestations as paramount, at different and succeeding times, among the priesthood, the nobility and the people.

The large windows of the Christian churches, like the full hieroglyphics of Egyptian temples, have at least a double meaning, the ostensible and the secret: the one is for the uninitiated; and the other imparts, to the select few, the inmost secrets of the mystic creeds. The hierarchal era continued down to the renaissance, when the symbolic expression of colors was extinct; and, as their divine speech was forgotten, rapidly ceasing to be a science, painting soared in skill, sentiment, emotion and effect, while it fell in profound significance; and became merely an art.

The aristocratic color-dialect was mainly coeval with the hierarchal, yet out lasted it for generations. Symbolical coloring changed not its terms, but its definitions, and was well fostered at court, under the name of heraldry; the painter-stainer* adopting what the painter had disdainfully cast aside. Yet modern painting still adheres to symbolism in church pictures. *White drapery* is appropriated to GOD, *red* to CHRIST, *blue* to the VIRGIN MARY, and *green* to Saint John.

The solar spectrum, as displayed by the prism in decomposing a ray of sunlight, contains seven colors, namely—

violet, indigo, BLUE, green, YELLOW, orange, and RED. Of these, three are primitives—blue, yellow, and red. Violet is composed of red in excess, with blue; indigo proceeds from blue in excess, with red; green is a compound of blue and yellow, and orange a mixture of yellow and red. With red we again turn around, in the same invariably circling order, so that the primaries and secondaries, forming a mystic seven, are a glorious emblem of eternity; an emblem which, whether we regard the majestic curve, or the gorgeous gradations of its bands, is redoubled in the rainbow.

Depending upon pigments, painting admits practically as colors two rejected by natural philosophy, namely, white and black, which, combined in different proportions, produce the endless variety of grays, these latter not known in original symbolical coloring. White, mixed with either of the primary or secondary colors, produces tints, while black, mixed with either, produces hues. The commingling of all the colored rays of the solar spectrum, or proportionately of the rays of the three primaries, produces white light; but the commingling, in the same proportions, of the three material pigments representing these three primaries, produces darkness, or black. The antique artists, in flat coloring—the very system which belongs to our subject, obtained a perfect harmony in the use of the three primitives for decoration by the skilful addition, either throughout the picture or in the border, of the proportional quantities of unmixed white and black.

The early color theory is not in perfect accordance with modern scientific demonstration; but, as to the ancients it stood for truth, by it we must explain their color symbols.

White represents light, and black darkness; but, as light exists only through fire, the natural apparent representative of which is red, symbolism starts with two primitive colors, red and

* This term, meaning, mechanically—copying herald-painter, has no reference to the expert wood-grainers and marblers of the present day.

white. Black, very properly, was deemed the absence or negation of color; and was attributed to the spirit of darkness. Red stands for divine love, and white for divine wisdom. Symbolic—not always natural—secondary colors arise from different combinations of the two symbolic primaries. Yellow, emanating from red and white,* symbolizes the revelation of the love and wisdom of God. Blue, likewise, emanating from red and white,† is the symbol of the spirit of truth. It indicates divine wisdom, manifested by life through air or azure, the spirit or the breath of God. Green is really, as well as symbolically, formed by the union of yellow and of blue, and signifies the active manifestation of love and wisdom. It was also the symbol of charity, and of the regeneration of the soul by works. Yellow and gold were in Christian symbolism the emblem of Faith. Saint Peter was represented by the illuminators and in the miniatures of the middle ages in a golden yellow robe, with the rod or key in his hand.

Some writers claim that when Christianity restored truth to the world, it also "reinstated symbolic color-language in its original purity." That its symbolic attributings to color were noble and pure in conception, and in that respect closely approximating those of the Adamite regime, there is good ground for supposing; but that the Christian import of any color at all corresponded with the ancient general or heathen import of that color is very doubtful.

With regard to whatever of symbolical coloring may have passed into the science of heraldry, the old armorists mostly expatiate to this extent:‡

* The true results of blending red and white are pinks or flesh tints.

† Consistency in mistaken reasoning would have deduced it from red and black. In the heavens it arises from the interposition of the atmosphere between us and the blackness of absolute space.

‡ And, for that matter, far beyond; but the details will be given in our article on *Heraldry*. The different old author-heralds, in their vanity of book-making, ascribed so many different symbolical meanings to these colors that at last they signified nothing at all.

C. J. L.

GOLD, technically OR, from the Latin *aurum*, through the French *or*, signifies wisdom, riches, magnanimity, joyfulness, and elevation of mind.

WHITE, technically ARGENT, from the French *argent*, typifies purity, continence, virginity, chastity, a clear conscience, and charity.

RED, technically GULES—of doubtful etymology, but referred to the Latin *gula*, throat, because the word *gills* is thence derived, and the gills of fish are always red—betokens strength, boldness, and hardiness; martial prowess; with gold, a desire to conquer; with silver, an intent toward the avengement of the innocent and the abasement of the envious; and, finally, the power of the Almighty.

BLUE, technically AZURE—by a corruption from the Latin *lazulus*, a sort of blue stone, *l* and *r* being convertible letters, shows a godly disposition and a perpetual renown.

BLACK, technically SABLE, attributed to the Latin word *sabulum*, coarse sand or gravel, imports constancy, divine doctrine, and loss of friends.

GREEN, technically VERT, from the Latin *viridus*, through the French *verd*, modern *vert*, conveys the sense of youthful love, bountiful mirth and gladness, and continence.

PURPLE, technically PURPURE, from the Latin *purpura*, a kind of shell-fish, out of which was first manufactured this color, imparts the idea of jurisdiction and of justice.

ORANGE, technically TENNÉ, meaning tawny, from the French *tanne*, tan-color, or the Italian *tanetto*, chestnut-color, by some heralds called also *bruske*, hints an addiction to vain-glory.

MURREY, technically SANGUINE, that is, blood-red, from the Latin *sanguineus*, sanguine; *sanguis*, blood—implies tardiness in battle, attended with final success.

It requires little penetration to see that the armorists had no well-digested symbolism of colors; and that their

efforts in this direction made not the slightest approach to a science, but were the vague results of imagination, assumption, or caprice.

Freemasonry and Odd Fellowship, along with all the lesser secret social and fraternal societies of the world, have their symbolic colors, specially appropriated to the various grades or ranks of the members of the respective orders, and many of these arbitrary symbolic meanings of interior decorations or of regalia*—as the temporary meeting-badges or parade uniforms of their members are somewhat grandly termed—are extremely rational, appropriate, and beautiful;† but, that these significations are identical with those of the color-symbols of the Ninevite palaces or the Egyptian temples would be most preposterous to say.

Here is some of the *a posteriori* com-

* *Regalia*, Latin, nominative plural, from *regalis*, for the tangible symbols of sovereignty. The crowns, sceptres, and jewels are the regalia of England; the great seal and the national flag are the regalia of the United States. Inside these various orders, the decorations of the respective highest officer would be strictly *regalia*. Custom, however, has given the word an added, yet a much lower, as a much more diffused, sense.

† That is, judging by their published books.

menting upon Christian symbolism: "In the transfiguration the countenance of our LORD became resplendent as the sun, and his vesture shone like the light. Such, in their highest energy, are the symbols of divine love and wisdom. The angel who rolled away the stone from the sepulchre, reproduced them in an inferior order. His face shone like lightning, and his robe was white as snow. Finally, in the last degree, appeared the just, in robes washed white in the blood of the LAMB. The artists of the middle ages preserved these precious traditions, and gave red or white costume, after the resurrection, to JESUS CHRIST."

The paper on Heraldry, in this number, will bear attentive perusal from all interested in the subject of CHRISTIAN COLOR SYMBOLISM, it being palpably evident, as hinted before, that the old heralds, whose ideas are therein detailed, had drawn freely, not only on their own imaginations, but upon all the preceding writers who touched, in any manner, upon the symbolic signification of colors, whether inside, or outside, of the science of arms.

ECCLESIASTICAL ARCHITECTURE.

BY CHARLES P. DWYER.

THERE is no more decisive proof of the enlightenment of a nation, than is to be found in the appearance of those two great instructors, the CHURCH and the SCHOOL. We unite them advisedly, for the one prospers with the other. The refinement of the mind is the safeguard of the soul. It is, then, to the relatively increasing number of these true temples of freedom, in the cities and villages of the land, that we look for the maintenance of national character; and not alone to their mere relative numbers, but to the architectural appearance they present.

It is very true, that the unpretending village church, or the quaint and primitive log school-house, possesses a particular power over us, which gives rise to pleasing feelings. But such a sentiment belongs more to the associations of memory than to any thing else. As a community accumulates wealth, it is but simple justice that the GREAT GIVER should have a due share of honor from man in the decoration of His Temples of Thanks. Hence, we naturally look to the ecclesiastical structure, for richness, purity and grandeur, in architecture. Like the religion it enshrines, it

should aim at perfect chastity and truth, and seek perfection, as nearly as is in the power of man, by mental and spiritual effort, to attain it.

New York and her great sister, Brooklyn, vie, with all other cities in the Union, to rear up suitable monuments to God; and in the examples thus presented might the student find food for his inquiring mind, in marking the distinctive features of each, and culling the too few beauties from the extraneous fallacies of the numerous elevations of this sacred field of Design.

Without any intention to be hypercritical, we must say, that it would have been well for the living fame of these architects, had very many of our church designs been better digested whilst on paper, and their discrepancies weeded out, before they were suffered to rise, as too enduring monuments of bad taste, painful to the intelligent mind, and unpleasing to the general observer.

As regards the color of material in ecclesiastical construction, we have an idea, of which we cannot divest ourselves, at the same time that we honestly hold ourselves open to conviction; that is, that the tint or color of the material should, as much as the style itself, convey to the mind's eye, the spirit of the design. To illustrate, we will adduce, as an instance of the opposite, the great Roman Catholic Cathedral, now in

course of erection on Fifth Avenue, New York. The style is Gothic; but the material is white marble throughout. Now, we hold that the *cloister shade* conveyed to the mind by this peculiar style is completely at variance with the vivid brightness of white marble.* We anticipate the defence of its admirers, that white is the emblem of purity. Very true. But why choose the sombre Gothic to clothe with it? The Roman and Grecian styles are objectionable to some, as having been the servants of heathenism. But, if such be an objection, and white marble must be the chosen material, why not have taken the Italian style? There are numerous specimens in Europe, which the architects of our day might still improve upon; and, although they could not surpass the Duomo of the great Florentine, they might well produce a more desirable design for the church in its entirety.

This field of ecclesiastical architecture is a vast one, and not to be lightly treated. We will, therefore, leave it for the present, to be shortly revisited; not with the ruthless intention of ravaging criticism, but with the cool, well-meant object of contemplation and investigating study.

* Yet as the cathedral of Milan—itsself of white marble,—proves, a sombre material is not absolutely necessary for the Gothic style.—EDS.

NEW YORK NOTES.

MANHATTAN ARCHITECTURE.

IN the time-honored history of the Old World, there is not to be found one parallel instance of the sudden uprising and magic growth of the City of New York. Rome's birth, progress, and culminating greatness, have been, and ever will be subjects for the delighted student to revel in; yet the advancement of that Empire of the Seven Hills loses

its charm of wonder, in the development of the day, in this progressive republic of ours, controlled as it is, not by the capacity of a single man, but by the combined mental power of a self-governing people.

What New York might have been under a continuance of the Colonial system, it is easy to conjecture from a

glance at the neighboring DOMINION OF CANADA, whose ancient cities, Quebec and Montreal, in vain seek to emulate our youthful Chicago !

Whence springs this wondrous stimulant to progress which, in every department of human affairs, is ever urging our nation ahead in the world's career, it is no difficult matter for thinking men to discern. A healthy state of action, acquired from the principle of independence, the latter begot of natural liberty, accelerates the brain and muscle of the nation, and pushes destiny forward with a force which no opposing power save that of the ALMIGHTY can retard.

The monarchies of the Old World have changed their bearing towards us, from coolness to acknowledgment, from contemptuousness to respect, not altogether free from envy and jealousy. Still, we advance, rapidly, yet steadily advance, until each and every path to the Temple of Fame is foreshadowed by our progress.

In this march of destiny, every part of our vast nation has its rank, and all go forth as one ! No jealous cavils may disturb the unity of determination which leads us onward. Yet the honorable rivalry of confraternity claims its right to stimulate our energies, and exercises a salutary influence over our whole system.

Villages aspire to be cities ; and not satisfied with the attainment of that object, when become cities, they seek to lead in their newly acquired rank, until the very efforts called forth in the glorious struggle, unite to vitalize the different sections, and give them national strength and character.

NEW YORK justly claims a proud share in this struggle for national fame ; and while she is not unmindful of the merits of her compeers, her efforts are directed to the front, let who will compete !

Abstaining from any allusion to her position in other departments, we confine our present thoughts to her efforts in ARCHITECTURE ; and these we propose to

review from time to time, keeping watchful step with her onward march.

The year we are passing through is one of great importance in the progress of our art on this continent, and especially in New York. Out of over one hundred architects in this city, not one can be said to be idle ; although the more favored few are ever ready to enter on still more commissions.

The fact is, the love for novelty has so far taken possession of the well-to-do citizens, that tearing down and improving seems to be the grand idea. It is a grateful sight to every lover of his country, and raises up natural feelings of triumphant pride, to see the cities of the Union putting forth such claims to the admiration of the tasteful visitor fresh from the art circles of Old Europe.

New York is the principal entrance for visitors to our Nation ; and, as the first appearance, either prepossesses the eye, or creates a doubtful impression, it is highly desirable that the best professional talent should be here displayed. Should, then, so important a consideration be left to the special ideas of any one man, whose taste is his own ; for, however conscientious in displaying it, may he not be far from reflecting the taste of the community he, in his designs, seeks to represent ?

No ! There is something radically wrong in this state of things, and it would be well to consider it. However gifted the architect may be, he yet can afford to seek and to accept a hint from another ; and, in fact, as his work is to please the eye of the million, the advice of many might afford him some desirable light tending to the perfecting of his design, and possibly to the ultimate popularization of it.

But here, alas, the inherent vanity of man obtrudes itself, and forbids this communion. The architect is prepossessed in favor of his own idea, and concludes : "*Populo me sibilat ac mihi plaudo.*"

Yes, this is too often the case. The

architect beards the public disapproval, and plants himself doggedly on his own opinion, as though he had a monopoly of art-judgment, and the community, for whom he builds, had no right whatever to think adversely to him.

That the public decision on matters of taste in design, is, after all, the true test of its actual value, may be a subject for close consideration. For the same object may produce very different effects upon various minds, and that which succeeds in winning the approbation of the majority may surely be considered as agreeable to taste.

It is true that the general public is ignorant of the rules which govern our time-honored art. But those rules were themselves made to produce effects tasteful to the public eye. Therefore, the majority has to be consulted; and, in such case, any architect who desires to succeed should seek as wide a range of opinion on his designs as he can obtain.

In this connection, we would urge the necessity for a more extended association of professional and amateur talent, aided by the frequent exhibition and critical observation of designs, before they become built-up facts, for better or for worse. That work, which will not stand the scrutiny of criticism, while on paper, most certainly will not gain favor in construction.

The profession would find it very advantageous to their art, to give as many opportunities as possible to the public to acquire a knowledge of the outlines of architecture. Popular lectures, public exhibitions, evening *conversazioni*, and

the like, each winter, would, any or all, be desirable. London laudably led the way, years ago, in this matter. Why should not New York and her sister cities follow?

We have, at present, a small society, entitled THE INSTITUTE OF AMERICAN ARCHITECTS; but its existence is almost unknown to the community at large, and it is ignored by many architects in fine practice. Now, this certainly does not meet the requirements of our progressive day; and can conduce very little, indeed, to the advance of the GREAT ART.

An institute, to be of real utility, should be such an one that every ambitious member of the profession would desire to belong to it, and be proud to attach to his name the initials of his membership.

We do not advocate the mere copying of the British Institution, founded, as it unhappily is, on aristocratic exclusiveness. What we aim at is a purely republican association, for the friendly interchange of art ideas, and the unselfish union of architects, patriotic enough to make it their conscientious duty to advance the national taste, and elevate the character of AMERICAN ARCHITECTURE, if we may be allowed so to term it.

More depends upon this subject, as concerning our country, than appears at first sight; and the positive necessity for an effort in this direction, becomes more and more imperative, as our mighty Nation develops itself, year by year, and has its majesty freely acknowledged amongst the dynasties of Europe.

STEAMSHIP LINES for Philadelphia should be the special aim of our merchants. With proper organization and effort, they could obtain, from Congress, subsidies for a term of years, in consideration of mail service, until the enterprise should be, in all respects, self-supporting. We, as the chief man-

ufacturing centre of the nation, and the place of greatest expanse, are really first, not second, of the cities of the Union; yet without direct steam communication with Europe, we shall always be held and reported "Number Two," unless we aid our natural advantages with all possible fair, social and artificial means.

WALL HANGINGS OF WOOD.

THE term WOOD HANGINGS, as yet, sounds rather strangely; but, in a little while, will become as familiar as the now accustomed one, Paper Hangings.

The tendency of men, engaged in introducing a new thing, is to underrate all preceding necessities, conveniences, or luxuries, whilst magnifying their own. In this manner, cloth hangings were to supersede tapestry; wainscoting was to supplant cloth-hangings; and paper-hangings were to do away with both. What was really effected was, what is effected always: the production of articles constantly enabling more people to have a handsomer interior decoration, than ever before. Cloth-arras has, indeed, disappeared; but the far more costly arras, that of tapestry, is yet made, and better than ever, as a regal luxury, or for royal presents. In like manner, wainscoting is still put up by the joiner, as an elegant adornment. Frescoing, in its various styles, and simple oil painting, for walls and ceilings, have always had their practitioners and their customers. But the great body of the world, until the introduction of wood veneers, has constantly adhered to paper-hangings; and those who wish to obtain certain characteristic effects will always employ the choicest styles of these.

At present, however, we design indulging ourselves, and, we hope, gratifying our readers, with a somewhat detailed account of PATENT WOOD HANGINGS, the materials for which, upon our own inquiry, have been obligingly furnished us, by the very gentlemanly Assistant Secretary of the PATENT WOOD HANGINGS COMPANY of PHILADELPHIA,* Mr. F. J. Rothpletz.

The Company themselves claim for their product a certain identity of nature with the old European wainscot. So far as the material, wood itself, is concerned, this is correct; but there is a wide and unbridgeable difference between the solid rails, panels and mouldings of true wainscot and what, for illustration's sake, we may call, the wood wall-varnish of these hangings. However, although the wood-hangings are not wainscot, they are excellent appliances for the same purpose; form a very elegant and durable ornament; and readily admit the most elaborate and beautiful forms of flat paneling, which, with a little thought, art and skill, can be converted into a very creditable wooden fresco. Any inquirer, who has ever seen a Florentine mosaic, can readily understand how this may be done.

The Roman mosaic, or the mosaic proper, is supposed, theoretically, to make a perfect picture, of lasting tints, because formed of a great number of homogeneously colored minute pieces of glass, or of polished minerals not liable to change of tone, through light, darkness, impure, wet or dry air, or chemical action. And, although a mere mechanical copy of a painted picture, yet, from its multiplicity of lights, tints, shades, shadows and hues, as it exactly reproduces the original, it is considered the result of a perfect art.

On the other hand, the Florentine mosaic—composed of a very few pieces of natural products, such as marble, jasper, malachite, and so forth, upon a basis and ground of black slate, each of these pieces selected for its own variation of color, the whole very artfully, if not artistically, conveying a picture—is not held, as any finer an art, than that producing pseudo pictorial effects with lights of mother-of-pearl, transpar-

* No. 1111 Chestnut Street. Capital Stock \$150,000. President, D. W. Stuart. Secretary and Treasurer, F. M. Roazor.

ent stains and opaque pigments, upon black *papier maché*. Yet, in both these instances, the results please, as exhibiting agreeable color effects, passably pictorial, from very simple means, handled, it may be, whimsically, or wilfully.

Frescoing will give us any tone and any effect of light and shade, that can be desired; but, along with the constant variation and surprise, in the surface of wood-hangings, we may also, by using lighter or darker woods, of the same variety, obtain the projection, or the recession, of panels and mouldings; and this, not being expected from the material, enhances the pleasure of beholding. For instance, if we suppose, all in the same woods, a square or oblong, depressed panel, formed by a simple straight-lined angle from the rails: for this, four different gradations would be required. The highest would be that portion—side and bottom—of the angled pieces, or mouldings, which received the full light, taken to be at 45 degrees in the two directions, namely: towards and across the panel, placed directly in front of the eye. The next in depth would be the advanced portion, or the rails. The recess of the panel itself would be still deeper; and considerably darker than the last would be the top and side of the plain angled moulding in shadow. If it is now remembered that there are many different kinds of wood, each with its variations of the same general color, all will readily see, that the only practical limits to such demi-pictorial effects, in flat wood paneling, are the comparative invention and skill of the operators. Then the workmen have—and sometimes take—the option of stains of different kinds, single, or repeated in application, to vary the tone of the particular wood employed, or to shape that portion supposed to be away from the light. Bead-mouldings of wood, either oiled, varnished, lacquered, or gilt, and polished mouldings of brass, or other metal, are attached for effect. Finally, the juxtaposition

of entirely different woods, may be used to extend the almost infinite variety of combinations, for use. Thus we may give dark panels to light rails, different toned mouldings from either; and so on indefinitely.

The Wood-Hangings admit of much bolder effects in relief. Grecian and Roman columns and pediments, Byzantine and Gothic arcades, and clustered columns, groined ceilings, Moorish arches and lone or twin spiral pillars, with Moresques and Arabesques are all at the command of the adept.

In the same degree, that ordinary veneers exceed solid wood in beauty of surface, the wood-hangings surpass such veneers in variety, translucency, and brilliancy.

The new mode of cutting these paper veneers—as from their extra thinness, we venture to call them—is calculated to bring out, not only every conceivable diversity of grain, but many small points, that even those most conversant with woods, in their application to ornament, could not imagine, until after a personal inspection. Then, if the fancy, not content with the interminable variations of nature, demands a step beyond her—or, perhaps, in sober verity, a little short—the lighter woods can be permanently dyed of any color designated. In dyeing, however, the lighter portions of the grain become dark and the darker light.

The machinery of the mill, engaged in preparing the wood-hangings, is of such complete adaptability, that every kind of wood can be cut, either with knives, or with saws, according to the wood, or the intent, from one-sixtieth down to one-hundred-and-fiftieth part of an inch in thickness—or query, thinness?—the usual thickness is from $\frac{1}{100}$ to $\frac{1}{150}$ part of an inch. The wood is either *sliced*, in the usual new method of cutting veneers, or it is *cut around the log*. An old fashioned veneer shows the outside or sap, of the tree, on the outer edges of the veneer, and the heart, or solid wood, in its central line. As said above,

this company often cut the hangings in the old veneer shape, by greatly improved means; but their most noticeable manner consists in this: A log of wood divested of bark and sap, is first reduced by ordinary turning, to an exact cylinder. It is then placed in a powerful lathe, specially adapted to the object, and the hangings are turned off, in a continuous sheet, from fifty to three hundred feet long, and of an uniform width, of from eighteen to forty-six inches. No matter what the gauge, the thickness must ever be uniform.

Whether to be sliced, or cut around the log, the wood is always previously steamed. Both styles of cutting must be seen, to be properly appreciated.

One most agreeable peculiarity of this method of cutting around the log, is that native woods, never heretofore considered at all ornamental, become decidedly so; and those, which from their smallness of growth, could not previously be employed in veneers, yield their unsuspected charms to the lathe. Thus: sturdy, close grained, lustrous dogwood, notwithstanding its supposed plainness, develops very beautiful figures and is more eligible for certain uses, on account of its creamy lightness of tint. If a still whiter and brighter apartment were desired, holly, with its exceeding fineness of grain and lustre of surface, would be employed. The maples alone furnish a great variety, each as beautiful as the other. American curled birch gives effects fully equal to the best of those of imported satin-wood; and, under certain treatment, superior. Oak, ash, chestnut, bass and poplar, for plain tones, produce fine interiors, with great range of figure, whilst blistered, mottled, curled and striped walnut yields the richest of contrasts with the golden-hued maples.

New experiments are constantly making, upon woods not hitherto used for decorative purposes; and, of course amongst many rejections, new names repeatedly occur. We do

not notice Elm; but it would answer well.

The present range includes Holly, Dogwood, white and yellow Poplar, rock, curled and bird's-eye Maple, Oak, Ash, Birch, Cherry, Satin-Wood, Walnut of all the figures, Sycamore, Mahogany, Rosewood, and a number of others. It is worthy of remark, that all these—even the first two, generally considered white—are warm in tone, so that no matter which is used, or what combination of any two or more, the apartment must appear comfortable and cosy. Holly is milk white; Dogwood, creamy, and, in some stocks, pinkish; Poplar, Naples yellow, or sometimes Dutch pink; Maple, in common varies from light to deep raw sienna and salmon; Birch and the superior specimens of Maple give charming deep tones of burnt sienna and light ones of Vandyke brown; Satin-Wood and some sheets of Birch approach fresh gallstone; the Oaks and Ashes afford light hues, referable to bistre, sepia, and other warm browns, while the curled, blistered, mottled and striped kinds of Walnut exhibit the deep hues of the same pigments; Mahogany affords Indian-red and other russets; and Rosewood, maroon.

In durability, Wood-Hangings are not surpassed by solid wood. They have been tested, for upwards of a year, in hot rooms, exposed to furnace or other heat, with more or less steam, remaining in as good condition as when the wood was first hung, without blistering, shrinking or cracking. The varnish, or other finish upon them, fills the pores of the wood, so as to give complete protection from the attacks of vermin of all sorts, from dry or wet rot, and, in fact, from any kind of deterioration. They are entirely free from the mineral poisons, so objectionable in the pigments used for the effects of certain wall-papers; do not absorb moisture; and receive no scent from smoke, or taint from the breath of the bed-ridden sick; so that

some of the best medical authorities have recommended them for sanitary reasons. They also have the advantage of being as readily cleaned as any piece of furniture, the surface being hard does not dent or mar easily, and may be washed at will. In fact they can be permanently applied, with paste, to the solid surface of wood, either of their own, or a different species; and thus would do pretty well for some kinds of furniture. They make beautiful sign-boards, especially for lettering in gold and finishing with colorless varnish.

In regard to economy, while the margin will vary—with the kind of wood, the different manifestations of that kind, and the manner of putting it on—yet the general cost is very moderate, not exceeding that of good quality paper-hangings.

This material, having great tenacity, is applied to walls by those used to putting on paper hangings, with even more facility than paper; especially in elaborate panel-work. As its tenuity is such that every little irregularity is perceptible through it, the walls should be rendered entirely smooth, all holes, cracks, etc., being stopped up with plaster of Paris and leveled. It is hardly needful to observe, that the walls should be perfectly dry, smooth and clean. Old and foul walls must be cleaned, either by a thin papering of pure white, or, much better, by re-finish plastering. All walls must be properly prepared with hot glue sizing, about the same as for ordinary paper hangings.

The adhesion of the Wood-Hangings is secured by flour-paste, as thick as it can be worked, which should also be forced through a fine sieve, to avoid lumps that would show through the wood. If not sufficiently pliable, the wood should be dampened, with a sponge and water, before applying the paste. A roller of sufficient hardness, covered with cloth, or with India-rubber, should be used to press the wood, smoothly and evenly,

on the wall; and all excess of paste driven from beneath, by rubbing, or pressing outwards towards the edges, with a wooden tool or scraper. When on the wall, and thoroughly dry, glycerine of medium quality, without acid, one part to every two of water, should be applied. Then finish in shellac, varnish, wax, or oil, according to taste. Prior to finishing, however, all paste must be removed from the surface, with water and sponge. After the first coat of wax, oil, shellac, or varnish has thoroughly dried in, all laps, or irregular edges, should be smoothed off, with fine sand-paper. According to the fineness of the work, from one to three finishing coats, of whatever material, will be given.

Five years ago, such a radically new thing, in wall decoration, if mentioned, would have been considered physically impossible; and, indeed, as quite akin to the new pleasure, that Xerxes offered a reward, to have invented for him; yet here it is.

If, in beautifying our walls, expense were no object whatever; and we longed for grace, sweep and textile richness, we should employ tapestry—could we get it. If we wanted depth and architectural lights and shadows, we should set up wainscot. If we wished breadth and highly artistic effects, we should select fresco. If we desired gorgeous richness, we should take artistic paper-hangings. If polished chasteness were our object, and the place a palace, we should choose paneled slabs of marble, mainly white; though in a modest dwelling, light, oil-painted walls and white kalsomined wood-work. But if, weighing all these, we sought a never-ending, ever-delighting series of surprises, quiet in mass and brilliant in detail—comparable only with the other beauties of nature herself, as, for example, the perpetual dissimilarity in the colors and markings of agates—without one instant's hesitation, we should select artistically panelled, pillared, arched and corniced HANGINGS OF WOOD.

A HISTORY OF ARCHITECTURE.

PRELIMINARY OBSERVATIONS.

ARCHITECTURE is primarily an useful art; and also ranks, side by side, with painting and sculpture, as a fine art. As the former, owing its birth to necessity, it sprang into existence coeval with the origin of man. As the latter, while manifested in a rude manner very early, it owed its rise to the increasing luxury and intellectual culture of succeeding ages. It may, therefore, be divided into the two grand distinct characters of useful and ornamental, both of which, however, are so intimately blended together, that neither bears away the palm from the other, so long as the purposes in view are satisfactorily attained.

Man's first care would, very naturally, be directed to the construction of some kind of shelter against the inclemencies of the elements; and in those primitive ages, the style of architecture, if indeed we can call it a style at all, was very crude and barbarous. But a study of the art, in its progressive course, bears evidence of the extended intellect and the concomitant increasing desire of man; and likewise attests the dawn of rising civilization.

In those wild and primitive ages, the habits, and modes of living, of our progenitors were so wandering and unsettled, that it led naturally to the adoption of a style of architecture adapted to their peculiar mode of life. As ages rolled on, we see evidences of a change in their habits, manner of living, &c., which, as a necessary consequence, exercised a material influence over the nature and style of their dwelling-houses. Man had then become gregarious, and had discovered, that commingling with his fellow-men was not only beneficial, and needful for his nature, but also of advantage in increasing the circle of his

powers and abilities. His intellect had now become more developed, enabling him to render the forces of nature subservient to his particular interests. Commerce had begun to civilize him, to enlarge his faculties, to open out to his genius new paths for the development of his resources, the enlargement of the sphere of his wants, and the duration of his enjoyment.

We might, were we not thereby encroaching on the subject of some projected essays in this Review—show the changes which have come over the spirit of architecture, in every succeeding age, down to our own times; and the influence, that the gradual, though certain, increasing development of the human intellect, and the spread of refinement and civilization, have had upon it. This subject, however, we propose to talk upon in subsequent numbers; and display in a brief, but concise, history of the style of each successive age.

We may here remark, that buildings, in general, can be divided into three different and distinct kinds, viz.: the domestic, the political, and the devotional; or, as described by some, to supply the material, intellectual, and religious necessities of man.

There are two grand and important necessities which have from the earliest age, controlled the domestic style of architecture, namely:

1st. Protection from men.

2nd. Protection from the elements of nature.

The former is not needed in all states of society; but the latter is always imperative, and embraces the climate, the topographical, geological and meteorological features of the country, exposure to sun, to hurricanes, and to storms of wind and rain. All such manifestations

of nature have an all-powerful and a very necessary influence over the style.

Without question, buildings ought to agree, in every part and particular, to and with, the intents and purposes for which they are designed; and should likewise never deviate in the slightest; for such a deviation from its original intent—detracting from the utility of the building, even though it should approach the ornamental—would give an incongruous character, displeasing to the eye.

Every edifice designed solely for use can be regarded in no other light than as to whether its finished state justifies the means for the attainment of that particular purpose. Hence it follows that the most important end to be attained, in the erection of an edifice, is: to discover in what manner it can best be brought to the highest standard of perfection. Even though possessed of beauty of detail and a pleasing general effect, when these essentially conflict, not only with main utility, but with the special purpose for which it is designed, the glaring impropriety and inconsistency, could not be overlooked.

In delineating, however, the plans or designs, for those three different kinds of architectural structures, which we have just named—whether intended for ornamental display, absolute utility, or a happy combination of both—there is an ample field for the genius of an architect to exhibit his inclinations, feeling, and attainments, or the prevailing fashion of the age in which he lives. For even architecture does not escape from the influence of Fashion. Then much attention is to be paid to the topographical features of the intended site.

There is abroad an impression, that architectural beauty, and attention to the demands of utility, are opposed to one another, and cannot be reconciled; in fact, that it is a hopeless task to endeavor to combine these two qualities. This, however, is a very erroneous idea.

Scientific and constructive skill must proceed, hand in hand, boldly, truthfully, and uninfluenced by such an opinion. Beauty of the right kind, consistent with the aspect of nature, will grow up, out of utility. In the works of nature, we always find the greatest beauty conjoined with the greatest wisdom, completeness and strength; and this same principle, if made the groundwork for every design, will hold good in architecture.

It is too common a habit, with many architects, to develop form and beauty, first; and then to take into consideration, the utility of the edifice in question. This only leads to mannerism. Indeed it must be admitted, that every architect is a mannerist, more or less; and that, in the majority of instances, we have only to examine the detail, and general leading principle of his works, to ascertain his personality. Exactly as any connoisseur has only to inspect a picture, to be able, at once, to pronounce, as to the studio whence it emanated. The foregoing remark may be readily justified, and most forcibly illustrated, by an examination of the edifices designed by the different architects of the past, and our own times, when it will instantly be perceived, that each one has a peculiar and distinct style of his own. We may, in this connection, mention the following celebrated architects, an inspection of whose designs will bear out the truth of our remarks:

* Ictinus and Callicrates were the architects, to whose grand conceptions, and lofty aspirations, we owe the Parthenon—with all its stern and noble serenity, and severe and sublime proportions—the cause of the envy and the murmurs of Greece, the glory of Athens, and the admiration of the world. The Parthenon, dedicated to Minerva, was erected in the palmy days of Greek art, and the statuary—to whose skill and art is due those magnificent sculptures, executed in high relief, colossal

images, and embellishments with which the edifice was enriched—was Phidias, whose distinguishing characteristics were grandeur and sublimity. This temple was of the Doric order, and built altogether of white marble, the plan of it being a little above twice as long as it is broad, viz., 217 feet 9 inches in the one dimension, and 98 feet 6 inches in the other.

Apollodorus was a most distinguished architect, who flourished in the reign of the Emperors Trajan and Adrian, about the beginning of the second century, or A. D. 120. To him, much is owing for the progress made in the classic style of architecture at Rome. He built several edifices round the Forum Trajanum, among which were the sculptured column of Trajan—still existing, in perpetuation of his skill.

In the Byzantine era, we have Anthemius of Thales, and Isidorus of Miletes, who were selected by the Emperor Justinian, to design and construct the Dome of the celebrated church of St. Sophia, at Constantinople, then Byzantium. This wonderful Dome ranks next to the Pantheon in antiquity; and forms the great type of the second period of Byzantine architecture, on which was founded all the subsequent architecture of the Eastern world. Anthemius had promised to raise a dome over this edifice, of such magnitude, as would eclipse the magnificence of the Pantheon. He encountered numerous difficulties; and died, before it was completed. The duty of prosecuting the work devolved on Isidorus, who finally accomplished the grand task. It was partly destroyed by an earthquake, a few years after its completion, and the present Dome was re-constructed by the nephew of Isidorus, who made it considerably higher than it originally was, and used a very light white brick instead of the common brick. From the prevailing manner of this era, grew out the Mohammedan and Moorish styles of architecture, as also that of Russia.

In 1377 was born Philip Brunelleschi, who afterwards distinguished himself, as one of the first architects of the day. After much opposition from his brother artists, he was intrusted, by the Florentines, with the task of raising a dome upon the church of *Santa Maria del Fiore*. His idea of having a double cupola—with a space between the inner and outer vaults, sufficient to admit of staircases and passages to the top—was deemed so preposterous and impracticable, that, at first, they would not consent to the proposition. But having, in time, overcome their prejudices, and demonstrated, by models and drawings, the practicability of his scheme, the work was given over to him; and the result of his conception and labors, was a magnificent cupola, pronounced by the great Michael Angelo, himself, to be a masterpiece of science. Brunelleschi was also the designer and originator of the Palace Pitti at Florence, besides numerous other edifices; which have gained for him the reputation of being the reviver of pure architecture. He died in 1444, aged 67.

Bramante, a celebrated architect, appeared about the year 1500, at a time when architecture was only reviving; and was not completely free from barbarous intermixtures and incongruities. He was selected by Popes Julius II. and Leo X., to execute the grand project of pulling down the old church of St. Peter's at Rome, and erecting a new one, on a scale of splendor and magnificence, that would astonish the world. Commencing in 1506, he prosecuted the work with great celerity and vigor, for eight years, when death put an end to his labors, in his 70th year. His original design was that of a Latin Cross, with three naves, formed by means of colonnades, and a cupola of the same dimensions with that of the Pantheon. This design, however, has been so very widely deviated from by his successors in the grand work, that very little of the present structure,

besides the four great arches over the tribune, can be said to be his. Owing to pontifical troubles, the work was allowed to remain in abeyance, until 1546, when it was committed to the celebrated Michael Angelo, who changed Bramante's design, of a Latin Cross, into a Greek Cross; and also designed the cupola, or dome, a model of which he formed, so that it should remain in the event of his not surviving, to complete the work. He was only spared, however, to labor at this grand task for 17 years, which he did entirely without any remuneration, having refused to accept aught for his labors. After his death, in 1564, in his 90th year, strict orders were issued by the Pope that Michael Angelo's plans and model should be minutely adhered to. Giacomo Barozio da Vignola in 1564, and Porta, in 1573, assisted by Domenico Fontana, successively carried on the work; and, at length, by the last named, in the pontificate of Sixtus V., the cupola was raised, after Michael Angelo's model.

In 1606 the plan of this building was again changed to a Latin Cross by Pope Paul V., who also erected the Portico, with the grand font, after a design of Carlo Maderno, an eminent architect. Thus, after being 67 years in hand, was finished this grand work, which surpasses all the most celebrated buildings, ancient or modern, not only in size, but in the excellence and beauty of its construction, and the elegant embellishments and admirable works of art, with which it is enriched.

About this time we must mention Andrea Palladio, a celebrated Italian architect, who was born in 1518; and, at a quite early age, obtained for himself a very high reputation, by the skill and taste displayed in numerous works of importance intrusted to him. Among them, we may name the Palace Foscari, in Venice, built in a style of pure antiquity. To Palladio is chiefly attributable the classic taste, which reigns in so many of the old buildings of Italy.

His *chef d'œuvre*, however, is the Olympic Theatre at Vincenza. The Palladian style, which originated with and has been named after him—has won for him an honorable and imperishable reputation.

Coming down more closely to our own times, we have Inigo Jones, a distinguished architect, born about 1572. He was Surveyor-General of Works under James I. and Charles I., and effected a great change in the style of the ecclesiastical architecture of England in that period.

Sir Christopher Wren, who was born in 1632, continued the good work begun by Inigo Jones; and the result of his labors in the art can be seen, to this day, in the numerous edifices, forming the attractions of the British metropolis, which owe their existence to his master-mind. He himself designed and erected no less than fifty parish churches, crowned by that noblest of all modern structures, St. Paul's Cathedral; the Monument, and other numerous public edifices in London; the Royal Palaces of Hampton Court and Winchester; and the Royal Hospital of Chelsea and Greenwich; besides others which we have not here space to enumerate, and any one of which would, of itself, be fame for any artist. It is worthy of remembrance and note, that on St. Peter's of Rome there were, from first to last, more than twenty architects, amongst whom were such men as Bramante, Raphael, Michael Angelo, Fontana, Bernini and Maderno, while Wren, single-handed, and unaided, planned and brought to a successful accomplishment, St. Paul's Cathedral. He died on the 25th of February, 1723, in his ninety-first year; and the inscription on his grave, in the family vault under St. Paul's, is a fitting tribute to the high services he has rendered the art: "*Si monumentum quæris circumspecte*"—"If thou seekest my monument, look around thee."

Of still later times, we have Sir John

Vanbrugh, the dramatist; Sir John Rennie; Smirke; and the last, one who has but just been taken away, Barry.

The fundamental rules of architecture, as laid down by Vitruvius, are the following:

1st. ORDER,

2d. PROPORTION,

3d. HARMONY,

4th. COMPOSITION, OR

FITNESS OF ARRANGEMENT,

5th. ECONOMY

We will take up each one of these heads and define it as simply as we can.

1st. ORDER, method, or regularity, is the relation which parts, considered as making up a whole, have to each other, and their proper arrangement, before being put together, as a whole. This, one of the most important of those principles, is properly put first; and ought to be the end and aim of all fine art. In the remains of Greek art, it is specially traceable. Wherever absolute uniformity, by producing too mechanical an effect, was displeasing to the eye, the Egyptian and Gothic architects varied the decorations of their capitals and bases, to a very considerable extent. Order requires that each separate piece be in a place peculiarly its own.

2d. PROPORTION is distinct from the foregoing, as being the relation, not of parts to a whole, but of parts to each other. The parts of a building may be said to be well proportioned, when, on comparing any two portions of the inner or outer structure, they are in keeping with one another, so far as dimensions are concerned.

3d. HARMONY is the symmetrical adjustment of parts, both in their separate dimensions and in their interlocking junctures. This principle relates to the graduation, in measurement, of all the parts, connected in a whole, to the dimensions of one, taken as a standard. It was by following out this idea of symmetry, as more particularly shown in the art of sculpture, that the famous Greek artists made their works true

ideals, and imperishable models, for all coming ages.

4th. COMPOSITION is congruity in the adaptation of parts, the disposing of portions of an extended edifice, so that, viewed as a whole, they shall be considered beautiful. To carry this principle out perfectly, it is requisite that, all the parts have an office, and that in size, position, and every other quality, they be adapted to that office. There is no one principle, which so surely proves the true genius and skill of an artist, as his success in securing perfect congruity, in every portion of his work.

5th. ECONOMY is the attainment of the useful ends for which the building was designed, without waste. We do not mean by this, merely the simple and vulgar economy of the purse, although this, of course, is also an essential feature; but the best manner of procuring a happy and wise combination of beauty and utility, retaining nothing superfluous, but omitting nothing likely to promote the end in view.

We could dilate, at great length, on each of these fundamental principles of our art; but it is not necessary here to do so.

We have already said, that where the purpose for any building, of which a design is in contemplation, is simply and solely utility; to attain this end, it is necessary, even, to sacrifice beauty and embellishments, should such be found inconvenient, or should they materially interfere with and detract from the end for which it was intended. On the other hand, where the end in view is simply ornamental, or the production of a structure, which shall please, either the common eye or the cultivated taste, the genius, science, art-education and innate feeling of the architect have a boundless field, wherein to exercise.

The great standard principles by which an architect must be guided are regularity and proportion, because from a true combination of these may be said to emanate the real intrinsic charm of

any edifice Throughout the fine arts, the study of architecture may be looked upon as one of the most delightful of all the courses they embrace; all the more where there is an innate genius to conceive and a well-stored mind replete with the images of the public buildings of former ages, to chasten and confirm.

In a future article we propose taking up this subject, and giving a brief *résumé* of the different styles of architecture, which have arisen, flourished and declined, from the earliest ages down to our own times, showing the different local causes, national traits and moral convictions, which gave origin, character and prevalence to these styles.

DRAINAGE.

BY A BUILDER.

HOW often is the complete drainage of buildings altogether overlooked, or else done in such a bungling and insufficient manner, that it is a source of continual annoyance and expense.

It should be, in fact, the first step of the builder to ascertain what are his facilities for drainage; to determine the point where all his drains must empty; and then to build his house, and regulate his grades accordingly.

You cannot have too much descent for drainage. The greater the pitch, the greater the velocity of the water; thence the more certain guarantee that, no sediment forming, the pipes will be self-cleansed.

The principles of underground drainage are so simple, and the culverts in this city so accessible, that buildings in almost all localities can be thoroughly drained. Vitrified pipe, such as is manufactured by the well-known firm of Link & Black, is the best to use, being strong and lasting. Its glazed surface, inside and out, renders it impervious to water or decay. Besides, as the interior is so smooth, it offers no resistance to the passage of dirt or sediment. The pipes are made three feet long, with a bell-head at one end, into which the pipe fits nicely; and when cemented with Roman cement, the whole conduit is perfectly water-tight. The proper way to lay the pipes is, first to dig the trench, with as

much straight grade, and as few angles, as possible, from the part to be drained to the culvert. Make the bottom of the trench even, deepening it where the bell-head rests, so the whole pipe can lie solid. Cement all the joints with Roman cement. Make every inlet into the pipe smaller than the main drain, and each new inlet into any of the branches smaller than the preceding one. Be careful to have every inlet properly and safely guarded, so that no foreign substance can get in the drain, to choke it up. Connect all your soil-pipes with the drain, as also all your rain-water conductors, and whatever waste-pipes you desire, and having put a trap in your main drain, before it reaches the culvert, to prevent any effluvia arising therefrom, you can fill up your trench, perfectly satisfied that your drainage will be thorough and complete. The iron bell-head trap is the most effectual and best inlet for surface draining.

Your drains, if laid with the care I have recommended, should never get out of order, and will last for ages.

A fruitful cause of the disarrangement and clogging of drains, is the bungling manner in which the pipes are joined. Instead of its being done carefully and skilfully, the work is intrusted to an ignorant laborer, who, with some mud or clay, fills the bell-head, thinking he has done it all right. The first heavy rain

washes the dirt all out of the joints, and, the sand and mud, rushing in, soon fill the pipes, and stop the drain. It may be repaired in that part, but only to stop up in another, until at last you are compelled, at a great expense, to take it all up, and have it laid properly.

How vastly important is this system of drainage! It requires, and should receive from the judicious builder, more care and attention than any other part of the premises, for what a miserable failure would be the most magnificent pile of buildings, without complete and successful drainage! It is absolutely essential to the health of residents of large cities, that every building should be thoroughly drained; and the first inquiry of every purchaser of real estate should be concerning the efficiency of the appliances to attain this important point.

Cess-pools accumulate large amounts of filth. Gutters, front and back of

dwellings, empty great quantities of fluid offal into the public street, there to decay and emit a pestilential odor, injurious to the health of all. These things are mistakes of the past. With adequate sewerage throughout our city, discharging into the great natural estuaries on the east and west, now should there be a new dispensation. It ought to be made obligatory upon the owner of every new building to have it drained underground.

Let the members of Councils take this matter into earnest consideration, and, with extended views upon the subject, not only welcome all petitions for sewers, but presently pass bills authorizing their construction in every main street throughout the city; thereby giving citizens facilities for drainage, and creating means to preserve the health of the people, without which all the sanitary measures that could be devised would fail.

LIFE AND TIMES OF MICHAEL ANGELO:

POET, PAINTER, SCULPTOR AND ARCHITECT.

BY G. W. RICHARDS.

THE amateur fondly lingers on the reign of Lorenzo the Magnificent, as the golden age of Florence, which—with that of his famous relative, Leo the X.—has been incorporated in our national literature, by the research and industry of the most elegant Italian scholar, that Great Britain has ever produced.

The love of the fine arts has been implanted, in the minds of the Italians, from an extremely early date. Scarcely had security dawned on the infant empire,—while she could already count her heroes and sages; while the divine wisdom of Seneca enlightened her, the strains of Virgil charmed her, or the thundering eloquence of Cicero inflamed

her senate—when the artist, with his rude tools and simple skill, pleased the popular eye; and cultivated the public taste. As civilization dawned, the arts rapidly progressed; and at the time of the Christian era, Rome was noted, as the nurse of the fine arts, the patroness of men of letters, and the abode of luxury and refinement.

After the introduction of Christianity, poetry, painting, sculpture and music declined; and, for some centuries, remained stationary. The heathen temples were ornamented with all the triumphs of the arts; the finest bronzes, the most magnificent marbles, and the rarest carving were devoted to the service of the Pagan deities.

The early Christians had confounded—in their horror of Idolatry—imitative art and artists; and regarded with decided hostility all images, and those who wrought them, as bound to the service of heathenism! All their visible representations of sacred persons and things were denoted by mystic emblems: the cross signified redemption; the fish, baptism; the ship, the Church; and the serpent, sin.

The fourth century witnessed the struggle between Paganism and Christianity; and the final overthrow of the former. The first representation of the SAVIOUR was in the character of the Good Shepherd, with the attributes of Orpheus and Apollo. In the cemetery of St. Calixtus, three heads were discovered—one of Christ, distinguished by a strong and almost coarse outline; the others represented St. Peter and St. Paul—all three from a master hand; and all retaining that expression of grave and holy dignity with which the early painters ever invested the Saviour and the Apostles. Mosaics were then almost universally adopted; and some rare specimens may still be seen in the oldest churches in Rome, Pisa and Venice.

Art in the seventh century was divided into two great schools: the ROMAN, distinguished by solemnity of feeling, and grandeur of expression; and the BYZANTINE, differing from the Roman, by greater mechanical skill, a profusion of gilding, and spiritless conception of forms.

In the tenth and eleventh centuries, Italy was in a condition of complete barbarism and confusion. Of this period, only a few extremely rude works remain. Some specimens of that age are preserved in the galleries of Berlin, Florence and the Louvre. Nicholas Pisano, who flourished at Florence in 1220, and died in 1270, gave the first grand impulse to modern art. Cimabue, who was his immediate successor, is styled, though incorrectly, by Vasari, the father

of modern painting. The latter's most famous monument is the church of St. Francis, at Assissium, which had been begun by several artists, was continued by Pisano, and finished by Cimabue. The splendor of the coloring, the beauty of the monuments, the elegance and dignity of the figures, all stamp it as a production of the highest order of genius.

Giotto, no less famed, and upon whom his mantle rested, was then Cimabue's pupil. Like his great successor Michael Angelo, Giotto was fiery and impetuous, haughty and disdainful; but like him, he was also skilled in the literature of the age; and deeply versed in the occult sciences of the time.

Cosmo the venerable—the founder of that princely house, which at different times has played a distinguished part, in the scenes of Continental history—was, at once renowned for his spirit of mercantile enterprise, fondness for literature, and patronage of the arts of design.

In his day, the love of liberty still reigned in full force at Florence, and in the defence of their rights, the citizens frequently had recourse to arms.

The character of Cosmo is painted, by Italian chroniclers, in the brightest colors. He had, at that time, a rare and valuable Museum of Busts, Coins, Vases and Medals; together with a large library. The same fleets, which returned laden with the wealth of India, were also filled with the most precious manuscripts, Egyptian papyri, and curious toys, in which, then as now, the Eastern nations excelled. Clive, when examined before the House of Lords, related that he saw, in the hoards of the East Indian princes, pieces of old Italian and Tuscan coinage. Some of those very books imported by Cosmo are now in the Louvre, carried thither by Catherine de Medici.

The conduct and retinue of Cosmo were marked by the most unpretending simplicity. Gifted by nature with a large and candid soul, his views were

distinguished by a liberality foreign to that age. Brunelleschi, Giotto, and Ghiberti—he who cast in bronze the celebrated doors of the Church of St. John, which Michael Angelo thought worthy of being the Gates of Paradise—were the principal artists of his day. Cosmo was one of the founders of the Bibliotheca Mariana, which, at the distance of three centuries, still offers to the learned its vast treasures. He died in 1464, at the age of seventy-five, deeply lamented by a grateful country, which inscribed upon his tomb the endearing appellation of *Pater Patriæ*. Cosmo was succeeded by his grandson, Lorenzo the Magnificent, who was then about sixteen; and who had been carefully educated by his mother, Lucretia—one of the most remarkable women of her age—who to the vivacity common to natures of a southern clime, united a ripe judgment and discriminating taste. Nature had framed Lorenzo in her very prodigality; and so great was his versatility, that he attained an unrivalled excellence in whatever he undertook. He may, perhaps, be compared to the Admirable Crichton, who lived rather later.

Around the youthful merchant prince, clustered all the men of letters, art, and science that Italy then produced. In this age, the anatomy of the human figure began to be more closely studied.

The collection formed by the care of Cosmo had been greatly increased; and under the fostering care of Fra Giocundo, a most learned antiquary, was constantly enriched by new specimens. It now forms a part of the Museum Florentinum.

The works of the ancient Grecian and Roman sculptors afforded Lorenzo much pleasure. He lamented the inferiority of modern artists; and wished to erect a better standard. He, therefore, proposed, for their imitation, the remains of the ancient masters, to elevate their views, beyond the forms of common life, to the contemplation of that ideal

beauty, which distinguishes works of art from mere mechanical productions. In pursuance of this object, Lorenzo removed many pieces of sculpture to his gardens, built rooms, threw them open to artists; and appointed Donatello, a sculptor of some note, superintendent. The influence of this judicious policy was soon felt, and, like the academic groves of Athens, the young came, to learn, and the old, to admire; a bolder and more masculine style was diffused over all works of art; the puerilities, then so much in vogue, were abandoned; and the graceful lines, waving curves, and anatomical details of the Grecian style were adopted. "But it was not until the time of Michael Angelo, that painting and sculpture rose to their true object; and, instead of exciting the wonder, began to arouse the passions and interest the feelings of mankind."

But in all ages, the arts of design, even among the rudest nations, have always been more or less cultivated. The nations of both Americas possess considerable imitative talent. The efforts of the Mexicans may stand the test of modern criticism. The vast colossal statue of Mexitli, their great war-god, clad in all the terrible paraphernalia of their bloody creed, is justly extolled, by all travellers, for its accurate finish and deep imagination. But the design of the modern is far different from the base—and often idolatrous—purposes, to which the fine arts were prostituted by the ancients. They sought indeed to refine the public taste; but the moderns seek to perpetuate the memory of the great and good. Where is the bosom so cold, that does not thrill, when the effigies of illustrious heroes, grave divines, and learned statesmen are regarded? They are the alphabet of history; and before the invention of printing, many sacred truths were conveyed by the painted and carved emblems.

The little Church of Santa Cröce, at Florence, contains the ashes of many

men who were not only great, in the history of their nation; but who will be celebrated, in all time to come. There reposes Alfieri, who poured out his restless soul in strains of tragedy. The monument of Machiavelli,—who was so greatly in advance of his times, next demands a moment's attention. The distant traveler then reads the inscription on the tomb of Galileo, the martyr of science; and next his eye rests on the name of BUONAROTTI! Who was Buonarotti? he mentally asks himself; and Fame replies, The artist, who painted the Vatican, with the terrors of the Last Day of Judgment, who designed the magnificent and stupendous dome of St. Peter's, the creator of the famous statue of Moses. Let us for a moment dwell on his life and works.

It was the age, in which talent seemed to attain a species of unnatural precocity. Italy arose from her slumbers. The intellect, with which she was filled, began to bud and blossom. The poet strung his magic lyre; and drew from its chords sounds of the most ravishing melody. The artist threw upon his canvas, the forms of grace and beauty; painted the agonies of a crucified and risen Lord; the holy dignity of the Virgin Mother; and the surpassing loveliness of her Divine Child. The sculptor wrought figures, which the fire of Prometheus seemed to warm into life. Bacon too, though rather later, ornamented that century; and opened the vast domains of thought, where the metaphysician might speculate, and the hard-working man, draw plain and homely lessons of wisdom, to guide his everyday life: for of what use is philosophy, if it does not lighten the cares of life, and teach men to profit by experience?

Cimabue and Giotto, as before remarked, were the fathers and restorers of modern Italian art. With these were associated Leonardo Da Vinci, the painter of the "Last Supper," Ra-

phael, Correggio, Giorgione, Titian, and, in Germany, Albert Durer—a rare galaxy! Leonardo Da Vinci, not only excelled as a painter; but also was an extremely skilful mathematician, architect and engineer. But genius properly belongs to no age or country exclusively. It is the gift of God to the human race. No matter on whom bestowed, it is the emanation of that same ALMIGHTY POWER, which, even in the meanest of his works, is always grand and magnificent.

Fine intellects invariably exert a strong influence in all ages, and the scholar's industry, the historian's research and the metaphysician's ingenuity, can always draw new sources of improvement and delight from the fountains of literature and science.

MICHAEL ANGELO BUONAROTTI was born at Chiusi, in Tuscany, March 6th, 1474. His father was mayor of the town; and the family were descended from the Counts of Canossa, an ancient feudal stock, though somewhat decayed. Some writers, however, assign Settignano, near Florence, as his birth-place.

From his earliest years, he evinced a striking love for sculpture; and when his tiny hands could grasp a plaything, the mallet and chisel were his favorite toys. This disposition was reproved by his father, who told him, that he sprang from an exceedingly ancient house, and that the Lords of Canossa had never yet carried the hod or handled the trowel. But the chisel of his son was destined to give to the world those mysterious creations, which will excite the wonder of all future ages. The pride of race was not so extinct in Michael Angelo's soul, as his father imagined. When after times had awarded to him his just meed of fame, and pupils from all parts flocked to his studio, he would take none but gentlemen.

Even in youth, kindred minds seek their mates. The intimate friend of the boy architect, was Granacci, a pupil of

Ghirlandajo, who furnished models for his studio, and imparted to him the instructions he had received. Ghirlandajo, charmed with the spirit of the youth, pleaded his cause with his father; and so far succeeded in softening the old man's heart that Michael Angelo was enrolled among his pupils.

But the future king of sculpture was not considered as a dependent. The son of Lorenzo, that magnificent patron of art, Politiano Ghirlandajo and all the most eminent men of Italy, who then flocked to the table of the future ruler of Florence, vied in paying attention to the young sculptor.

Lorenzo, one day walking in the garden, saw the young man, polishing the head of a fawn: "You have done well!" said he, "But who ever saw an old fawn with his mouth full of beautiful teeth?" The criticism was just. Two of the offending members were knocked out; and holes made in the jaw, as if lost by age.

From that time, Michael Angelo pursued nature as his model, traced every bone, nerve, muscle and sinew; investigated the play of the fibres; and then transferred them to marble.

In these engrossing occupations, days—nights—were passed;—nor did the zealous worker desist, till out-tasked nature demanded her rights, and the great artist has been known to drop from fatigue.

"Grim-visaged war," exhibited her wrinkled front in fair Florence; the people, who were exceedingly jealous, when their liberties were called in question, thought that some of their ancient prerogatives were invaded, and flew to arms to maintain them.

The Medici were temporarily expelled from Florence, and Michael Angelo was compelled to retire to his father's house. About this time, he produced the cartoon of the battle of Pisa. This has since perished; but those who saw it, pronounced this sketch, a master-piece.

The artist chose the moment of the attack upon the van, while the men were bathing in the Arno; and seized the opportunity of representing many naked figures, rising from the water in the most energetic attitudes.

Michael Angelo was a great admirer of the ancients; and copied them very closely. His statue of Cupid was greatly admired, and reckoned as a veritable antique. As such it found its way to the cabinet of the Duchess of Mantua. The Cardinal di San Giorgio, hearing of his merit, invited him to Rome; and lodged the young artist in his palace.

Julius II., who then wore the Papal tiara, was of a fiery and impetuous disposition; but had a keen insight into character, and was a great patron of talent.

He pressed the young sculptor to remain, and finish his tomb, which he desired built in his lifetime. A quarrel, however, ensued, and Michael Angelo withdrew to Florence. But the Pope, not wishing to lose the services of the great artist, despatched a messenger to the Gonfaloniere Soderini, praying that he would entreat the Florentine, again to visit his capital. Michael Angelo acceded to the Pope's wishes; but told him at the same time, that he could not remain to receive so many insults. The old pontiff gave him his blessing; and a friendship commenced, which ended only with the life of Julius.

Michael Angelo then undertook his first great work, the decoration of the vaulted ceiling of the Sistine Chapel.

With the mechanical part of fresco, he was but little acquainted; and wished the execution of it transferred to Raphael. The Pope insisted that he alone should complete the work; and assigned him several artists of eminence as his assistants. These men could not comprehend the grandeur of their master's conceptions; and in a fit of anger they were all dismissed.

He now resolved to work alone; and

made all his preparations himself; even mixing his colors. In the beginning he painted the Deluge. The figures were too small—a fault corrected in the other parts. The centre of the ceiling has four large and five small compartments:—the creation of the sun and moon; Adam, and the expulsion from Paradise; the Deluge; the gathering of the waters; the ALMIGHTY separating light from darkness; the creation of Eve; the Sacrifice of Noah; and Noah's Vineyard are represented in the five small compartments. The artist has placed the prophets and sibyls, who foretold the coming of the REDEEMER, in the curved part of the ceiling. These are of wondrous beauty, and full of character. Below these, again, are groups representing the earthly genealogy of CHRIST. These figures are full of grace and tenderness; and appeal strongly to the imagination. When the Sistine Chapel was completed, Michael Angelo was but thirty-nine. Julius III. expired in 1513; and was succeeded by Leo X., of the house of Medici; but the new sovereign did not greatly admire the genius of Michael Angelo. Perhaps the stern, unbending disposition of the great sculptor did not accord with the gay temper of the pontiff. Raphael was the latter's favorite, and Michael Angelo was almost neglected. During the reign of this prince, Michael Angelo was sent to Florence to superintend the building of the Church of San Lorenzo, and the completion of Santa Croce; but scarcely any thing was effected. Clement VII., another prince of the house of Medici, ascended the pontifical throne in 1523; and was anxious to build a chapel in the church of St. Lorenzo at Florence, to receive the tombs of his ancestors. Six of our artist's greatest works adorn this building. The statue of the Duke Lorenzo has long been famed as one of his greatest efforts. Rogers, the great poet, mentions it, as one of the most real, and unreal things, that ever came from the chisel; and thus describes it:

"Nor then forget that chamber of the dead,
Where the gigantic shades of night and day,
Turned into stone, rest everlastingly

There, from age to age,
Two ghosts are sitting on their sepulchres.
That is the Duke Lorenzo. Mark him well!
He meditates—upon his hand his head,
That from beneath his helm-like bonnetscows!
Is it a face, or but an eyeless skull?
'Tis lost in shade; yet like the basilisk,
It fascinates, and is intolerable."

But peace did not long reign over Italy. Rome was taken and sacked by the army of the Constable de Bourbon in 1527. Again the Medici were compelled to abdicate the government and retire from Florence.

Michael Angelo's varied talents were at once acknowledged, and he projected a plan for the defence of the city. He was, next to Leonardo da Vinci, the most skilful engineer of the century; and even now his fortifications, rams and other warlike machines would be of great service in a protracted siege. The city was surrendered by treachery, and he fled; but was reinstated in his former position by the intercession of the Pope. Paul III. now sat in the chair of Peter. This pontiff, though seventy years of age, was anxious to complete the interior of the Sistine Chapel, which had been left unfinished by Julius III. and Leo X., and he asked Michael Angelo to complete his design. The Last Judgment is represented on the wall, at the upper end of the Sistine Chapel. The Messiah is in the centre, in the act of pronouncing the dread sentence: "Depart from me, ye accursed, into everlasting fire!" The Virgin Mother sits alone by the side of her DIVINE SON; the prophets, Apostles and martyrs are on the sides. Angels, bearing the cross, the crown of thorns, and other emblems of the passion, hover in the air. There is another group of the Celestial ministers, lower down, holding the Book of Life, and sounding the awful trumpet. The blessed ascend, and demons haul down the condemned to everlasting fire. There are at least two hundred figures in this work. The fresco has many faults; and

by some exceedingly eminent critics it is reckoned inferior to the painting of Orcagna, in the Campo Santo of Pisa. Michael Angelo designed painting the defeat and fall of the rebel angels, on the opposite wall; but this was never executed. The Last Judgment was thrown open to the public, December 25, 1541. The great artist was then sixty-seven, and had been employed on the cartoons and paintings nearly nine years.

While Michael Angelo had been engaged on the Last Day of Judgment, the Pope had built a small chapel entitled *La Capella Paolina*, dedicated to St. Peter and St. Paul. The Conversion of the first, and the Crucifixion of the latter, by the great painter, decorate the sides of this section of St. Peter's.

But greater honors were about to inure. In 1544, Paul III. named the great Florentine, as architect of St. Peter's. Michael Angelo was then in his seventieth year. The venerable artist at first refused, alleging great age; but ultimately yielded to the solicitations of the pontiff, and agreed to undertake the work, on condition, that he was to receive no salary; that he was to be at full liberty to discharge any of the workmen he might see fit; and to make any alteration in the original plan he thought proper. The government willingly conceded all that was desired; and the work proceeded. Age had not impaired the faculties of the great Florentine; and Michael Angelo, in his intervals of leisure, built a palace on the Capitoline Hill, for the Senators of Rome; and two galleries, for the reception of ancient sculpture. He also completed the unfinished Farnese palace, and a flight of steps to the Convent of the *Ara Cœli*. "It was in the church to this convent, that Gibbon first thought of writing the *Decline and Fall of the Roman Empire*."

Many and bitter enemies assailed the illustrious architect; and endeavored to dislodge him from his post, but uselessly, for the court was too firmly convinced of his talents and integrity.

He was also asked to build a bridge over the Tiber, where the *Pons Palatinus* formerly stood; but an opposing faction threw obstacles in his way, and the enterprise was confided to one Bigio, who was incompetent; and, in five years, the whole was swept away by a flood, as Michael Angelo had predicted.

Two Popes had been called to their final account, since Michael Angelo first undertook the charge of St. Peter's. Pius IV. now grasped the crosier of St. Peter. Considerable progress had been made in the erection of St. Peter's, which was finished to the base of the cupola; and a model of the dome was made. Want of money retarded all future operations for some time. Again did the foes of the mighty mechanic labor to deprive him of the post; but the pontiff declared that he should do entirely as he wished, and that all his plans should be carried out after his death. This ended the controversy. But the life of the builder of St. Peter's was near its close; and he expired, at Rome, on the 18th of February, 1564, at the age of ninety, saying to his attendants: "In your passage through life, remember the sufferings of JESUS CHRIST." The remains of Michael Angelo were buried in Rome, but transferred to Florence. A mass of requiem was solemnly celebrated in the church of St. Lorenzo; and a funeral oration pronounced by Varchi. The body now reposes in Santa Croce. The vault was opened in 1720, and the corpse was seen, clad in a green velvet gown and slippers.

The house of Michael Angelo, at Florence—which was filled with works of art—has become the property of that city by the bequest of Signor Buonarrotti, one of the great sculptor's descendants. As some opposition to the will was made by Signor Buonarrotti's heirs, the Tuscan government amicably settled the controversy forever, by paying them four thousand scudi. It is stated that among the

treasures, thus become public property, are a number of letters, from his illustrious cotemporaries, and several unpublished works by Michael Angelo himself.

Michael Angelo's personal appearance could not be termed prepossessing. He was of medium height, and broad shouldered. His forehead was ample, and expressed great intellect. His hazel eyes were lively and expressive. His nose had been considerably injured by a blow from Torrigiano. The great artist was rather fond of solitude; but liked in later life the company of the learned. He was exceedingly free from avarice; and worked much more for the love of art than for gold.

Michael Angelo frequently expressed himself in verse with considerable ability. He composed a sonnet on the death of Vittoria Colonna, Marchioness of Pescara, a lady whose superior mental endowments had won his highest esteem. Some of his fugitive pieces have been collected by Wordsworth, and were published with a scholarly and chaste introduction by Mr. I. E. Taylor. In the elegant language of Roscoe, "as a poet, he is entitled to rank high among his countrymen; and the triple wreaths of poetry, painting and architecture, with which his disciples decorated his tomb, might, without exaggeration, have been interwoven with a fourth."

As a man, his personal character was unspotted; as an artist, his fame is unsurpassed; and his years of action form a proud era in the history of Italian art.

The life of the great Florentine was protracted beyond the ordinary period granted to the human race. During its span were many great and important changes. He saw the termination of the Middle Ages; and beheld all their institutions vanish. In his day, the discovery of America, the expulsion of the Moors, and the publication of the finest edition of the Holy Scriptures so far known, were the most important events occurring to Spain, then the greatest monarchy of Europe. He marked the diadem pass from the wily Ferdinand, to be worn nervously by Philip II. Meanwhile, in England, the wars of the Roses ceased; and the great Elizabeth firmly and wisely ruled the realm.

Nor was he an uninterested spectator of all these events, whether transpiring at home, or abroad. His own native soil was greatly convulsed. The French were then the plague of Italy, and long and fearful were the contests of Charles VIII. and Louis XII. Rome was sacked by the Constable de Bourbon; and the Florentines were forced to

"Own a sceptre and endure a purple robe."

Michael Angelo enjoyed the friendship of six Popes, and all the learned of his time; and now, when the postilion points out the distant city, with the exclamation, "*ecco Roma!*" the first object that strikes the eye is the Church of the chief of the Apostles, whose mighty architect needs no better or more enduring monument than its magnificent Dome.

MICHAEL ANGELO,—

Already well handled above, in a literary point of view, by Mr. Richards, who has certainly called up before us the very form and spirit of the time—will shortly be our theme for another article or two, wherein the arch-artist will be discussed, with special reference to the history and characteristics of his great architectural works. Few men, not immediately concerned in the government of their fellows, either through arms or polity, or both, ever had a larger share of public attention, or ampler inherent endowments more faithfully cultured to more marvelous general desert.—Eds.

HERALDRY.

POINTS OF THE ESCUTCHEON:—TINCTURES.

WE may now consider ourselves as fairly entering upon the study of Heraldry. Many reflections might here be made, and much general information could now be imparted; but, altogether, it will be better for us to learn, at once, for the sake of better fixing the mind, a few fundamental and comprehensive points.

Our first article strove to explain the **USES OF HERALDRY** in a republican country; and our second was devoted to the **SHAPE OF THE SHIELD**, which at one time was both a weapon of military defence and a ground whereon were painted *hereditary marks of distinction*, technically known, in Blazonry, as **ARMS**.

The subject of the second article is so far continued in this, that every one of our ten illustrations is different in shape. Six of the shields presented are different forms of the lozenge, set apart for women; and the remaining four appertain, of course, to the armory of men.

THE FIELD

is the term set apart, by the heralds, *for the entire surface of an escutcheon, or of a flag*. It may have some reference in its English form, to the fact, that the marks upon it were, primarily, only derived from services in the field of war; but merely as an arbitrary designation, it is well chosen, from its signification of expanse. Within a few years, a singular misuse of this technical term has sprung up, in American manufactories of flags, &c., it being applied by both employers and employees, to the *quarter*, or the *union of national ensigns*, or, in other words, to the blue portion containing the stars; whereas, properly, both *field and flag*, or *field and shield*, always mean *the entire surface of the general colored symbol*.

In heraldic banners, the staff end of the drapery corresponds to the top of the shield; but, in applying the science to modern flags, which may be done, with the utmost readiness, it is better to make the staff end of the ensign the dexter side of the shield. This latter method would correspond with the feudal practice for battle banners, whereon coats-of-arms were painted. The staff end answering to one of the sides of the shield; and, in transparent emblems, the description being from that side of the flag having the dexter side of the field towards the staff.

CHARGES

are *all figures of whatever kind—whether heraldic ordinaries, sub-ordinaries, or other objects,—depicted upon the surface, or field, of an escutcheon*.

POINTS OF THE ESCUTCHEON.

It is often necessary in blazoning,—*i. e.*, in technically describing a Coat-of-Arms,—to express the exact position of small bearings or charges. For this purpose, the old heralds settled upon a certain number of points, whose acquisition by the learner will be of the utmost benefit. To determine these, the shield is supposed to occupy a much larger space than usual; to be in reality a full-sized, ancient buckler; and to be shaped with a very close approximation to rectangularity.

It must first be understood, that the shield is considered as if borne squarely before a man, in defence, and that the beholder confronts the wearer. That part of the escutcheon, then, on the wearer's right hand will be upon the gazer's left, and that part on the owner's left will be upon the inspector's right. This will account for the apparent arbitrary reversal of the mean-

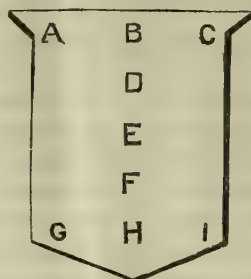
POINTS OF THE ESCUTCHEON.

A. Dexter Chief.

B. Middle Chief.

C. Sinister Chief.

D. Honor Point.

Heraldic Right,
or
Dexter.Sinister,
or
Heraldic Left.

E. Fess Point.

F. Nombri Point.

G. Dexter Base.

H. Middle Base.

I. Sinister Base.

ings, right and left, or *dexter* and *sinister* in heraldry.

The whole upper portion of the shield, representing here, the position of a man's head, is called **THE CHIEF**; and the entire lower part, corresponding to his hips and groins, is termed **THE BASE**. These must not be confounded with the ordinaries of the same names, which, however, occupy the same places.* The position of the man's heart determines the **HONOR POINT**, D. The middle of the military waist-belt, typified in armory by the *Fess*, fixes the **FESS POINT**, E. The **NOMBRI POINT**, or *Navel Point*, covers the site of the navel. A, B, and C, are respectively, **THE DEXTER, MIDDLE and SINISTER CHIEF POINTS**; and **THE DEXTER, MIDDLE and SINISTER BASE POINTS** are respectively, G, H, and I.

The use of these points of the escutcheon will be immediately obvious, when we cite the arms of the Canton Schweiz of Switzerland, namely: "Gules, in the Sinister Chief point, a cross coupé argent," whilst the arms of Switzerland herself are "Gules, a cross coupé argent." While cross, in heraldry, is understood to be a cross of equal width and length of limbs, bounded by straight lines, whereof one limb is perpendicular and the other horizontal, and both reach

entirely across the shield, the word *coupé*, from the French *couper*, to cut, implies, that the limbs are cut across, at right angles, so that the tincture of the field shows all around the cross. This ordinary description following the above two blazons, or heraldic descriptions, will serve to prove the extreme conciseness of the nomenclature of heraldry, which, in truth, is only equalled in that respect by the technical diction of seamanship. Thus one of the most purely ornamental and one of the most useful branches of knowledge come together. They have, however, an intimate and useful point of contact, viz.: national flags, jacks, pennants, streamers, signals, &c., none of which can be *properly* devised, without a knowledge of heraldry.

An elementary acquaintance with the rules of Arms Pictorial will be highly beneficial to architects, artists and decorators generally. It will afford them additional means of imparting beauty, and save them from the perpetration of amazing and often amusing blunders.

We will suppose the reader to be inspecting an American silver dollar or half dollar: a bold supposition in these days! He finds the lines of the upper portion of the shield on the breast of the national eagle are drawn horizontally, and, also, that some of the perpendicular stripes of the escutcheon are expressed by vertical lines. He comes to the conclusion that these variations arose from the die-sinker's convenience, or, perhaps, from

* The *Base*, in shape and position, is identical with the *Plain Point*, which, in *tenney* or in *sanguine*, is that one of the *Abatements-of-Honor* appropriated to a liar: in any of the other tinctures, it is honorable, and not an *Abatement*.

the general appreciation of the harmony of shading-lines to outlines. This would be very reasonable, and yet it would also be an egregious mistake. Those apparently chance lines were used by the medalist, in strict conformity with the rules of heraldry, to express *blue* and *red* for the parts so lined, and *white* for the parts left unlined, or blank.

The general scheme for the expression of colors by arbitrary lines was invented by SYLVESTER PETRA-SANCTA, a celebrated Italian herald of the seventeenth century, whose work, in Latin, is very scarce. We have, however, had the good fortune to see a copy. Petra-Sancta's paradigm was so happy and useful, that it was adopted with avidity by all the heralds of Europe.

There is another method of exhibiting colors in outline drawings of coats of arms, left unfilled or unfinished for want of time, by inserting certain conventional letters in the various parts, or, if these are too small, by drawing a line from the part to the margin and placing the appropriate letter at the end of the line. This is called Tricking. Both these modes are given, in detail below.

Field, in his "Rudiments of the Painter's Art, or a Grammar of Coloring," remarks: "Heraldry, the most arbitrary of the sciences, having no foundation whatever in nature, has, nevertheless, employed colors with more consistent classification, than the more natural and legitimate arts, and being intimately connected with decorative painting in the emblazoning of arms and the illuminating of missals, books, deeds and treaties; and being also of occasional reference to higher art, a brief notice of heraldic coloring and its symbols may be considered a useful appendage to a work on painting. The Table may also serve by the comparison of colors, jewels, &c., to denote the colors themselves, and identify their names according to natural resemblances, as a guide to the constructing of signals, &c.

"The manner of denoting colors by the scoring and crossing of lines on escutcheons may be usefully employed by artists in sketching as memoranda for painting the accidental and local colors of objects. Those who take interest in *symbolic coloring* may have ample gratification by referring to Baron Portal's work* on the subject, translated from the French, by J. Inman, Esq."

THE TINCTURES.

HERALDIC COLORING is based upon the general principle of sharp contrast, because arms were originally painted upon flags, banners, or shields, to be distinctly noted afar off and thus serve to distinguish friend from enemy; and also aid as rallying marks amid the turmoil and obscurity of battle. Many heraldic and literary authors incline to think the heraldic law of colors was settled by degrees; but the whole affair is so simple, homogeneous and well adapted, that we are forced to think it the necessary beginning.

The figures of coats armorial are deemed by some authorities the essential parts; and the colors the accidental: yet, as exactly the same figures with different colors are held to be entirely different arms, we submit, that such a position is a fatal error; the more that the field and figures uncolored could not possibly answer the purpose intended, namely: the production of an ensign recognizable at any distance it could be seen at all.

The heralds use as colors, technically TINCTURES, Or, Gold or Yellow, Argent, Silver or White, Gules or Red, Azure or Blue, Sable or Black, Vert or Green, Purpure or Purple, Tenné or Orange, and Sanguine or Murrey. Or and Argent they term METALS; and all the others they call COLORS.

They do not allow metal upon metal,

* "Couleurs Symboliques." See also "Symboles des Egyptiens."

or color upon color. Thus, if the Field be metal, the Charge must be color: if the Field be of color the Charge must be of metal.

This fundamental law sweeps away at once all tendency to either indistinctness or discordance of coloring. Whatever is heraldically devised must always be pure and bright in color effect.

Heraldry also allows the introduction of natural objects in their natural colors. In blazoning, the tincture of such objects is always expressed by the technical term *PROPER*. It must be remembered by those about inventing coats-of-arms, or ensigns, that symbols with *proper* tinctures fail in distinctiveness; and are very little better than unarmorial devices for signets. For any purpose of public display they are scarcely worth aught.

Among heralds, these color terms are universal, except that *vert* being their common name for *green*, the French use *Sinople* for that tincture.

Some of the early heralds, in the pride of place and authorship, not content with one set of technical terms for tinctures, invented two other sets, one for sovereign princes and one for nobles, the gentry being blazoned with the general set already described. There seems also to have been a fourth set, whose components were synonymous with the popular terms for the colors,

used for the arms of convicted traitors after sentence. Concerning this *crochet*, Kent, vol. i, p. 31, says: "And 'if such coats [of traitors] are at any 'time thereafter to be blazoned, it shall 'be by the common and usual names 'for the tinctures whereof it does consist, as Yellow, Red, Black, &c., they 'being esteemed unworthy of any Degrees, Tokens or Notes of Honor.'"

The Tinctures, alone, form Arms in some cases, though this is unusual.

OR.—Kent, from Vallemont's Elements of History, vol. i, p. 333, gives the arms of the French family of *Menessez* as simply *Or*.

GULES.—*Eumenius de la Brect*, an eminently valorous gentleman of England, who accompanied King Edward I, at the siege of Kilaverock in Scotland, bore only *Gules*. The family of *Rubei*, in Tuscany, bore the same color only. Vallemont, vol. i, p. 333. So also the family of *Narbone in France*. L'Etat de France, 1669. Vol. ii, p. 438.

SABLE.—The ancient Counts of *Tournay*, as the same Vallemont asserts, bore in their shield only *Sable*.

The attached complete Table of Tinctures will be found extremely useful for rapid reference. Along with it we give, in detail, THE HERALDIC COLOR LORE, which has very considerable bearing upon the SYMBOLICAL COLORING of the Middle Ages.

NOTE.

WE have spoken of the important invention by PETRA-SANCTA for expressing colors in engraved lines and dots. As a bibliographical curiosity, we give a transcript of the title of the extremely rare book, first embodying this armorial convenience, from a copy in full vellum, prime interior condition and good margin, belonging to the very valuable library of a gentleman of this city.

"*Siluestri a Petra Sancta Symbola Heroica. Amstelædami apud Janssonio-Waesbergios & Henr. Wetstenium. MDCCC LXXXII [i. e. 1682].*"—1 vol. sm. 4to. Many curious old copperplates, worked with the letter press, and a few wood-cuts. Fine portrait and arms of Petrus Aloysius Carafa, Cardinal-Archbishop of the German provinces, and Papal Nuncio; and an extended genealogy of the Carafa family.

Petra-Sancta's system of giving the Tinctures is to be found on pages 313 and 314 of this bibliothecal gem.

C. J. L.

A COMPLETE PARADIGM OF HERALDIC TINCTURES.

How Engraved.	Water-color Pigments.	Shadings.	Natural Colors.	Tricking Letters.	Abbreviations.	Metals.	Colors.	HERALDIC TINCTURES.						Traitor's Blazon.
								Reasonable Blazonry.	—	Sov'reigns	Nobles.	Gentry.	Astronomical Signs.	
								Trinctures.						
Dots.	Gold Leaf, Gold Shell, Cadmium, or Orange Chrome.	Burnt Sienna.	Gold, or Yellow.	O.	Or.	Or.	Or.	Or.	Sol.	Topaz.	Or.	Or.	☉	Yellow.
Highest Light, or Blank.	Silver Leaf, Silver Shell, or White.	India Ink, or Neutral Tint.	Silver, or White.	A.	Ar.	Arg ^t .	Argent.	Argent.	Luna.	Pearl.	Argent.		☾	White.
Perpendicular Lines.	Chinese, or English Vermilion.	Lake.	Red.	G.	Gu.	Gules.	Gules.	Gules.	Mars.	Ruby.	Gules.		♂	Red.
Horizontal Lines.	Ultramarine, or Cobalt Blue.	Indigo.	Blue.	B.	Az.	Azure.	Azure.	Azure.	Jupiter.	Sapphire.	Azure.		♂	Blue.
Perpendicular Lines crossed by Horizontal.	Ivory Black, Lamp Black.	Gum Arabic.	Black.	S.	Sa.	Sable.	Sable.	Sable.	Saturn.	Diamond.	Sable.		♂	Black.
Dexter Diagonal Lines.	Verditer and Gamboge mixed, or Green Verditer.	Gamboge and Indigo.	Green.	V.	Vert.	Vert.	Vert.	Vert. [Fr. Her. Sinoie.]	Venus.	Emerald.	Vert.		♀	Green.
Sinister Diagonal Lines.	Purple Lake.	Gum Arabic.	Purple.	P.	Purp.	Purpure.	Purpure.	Purpure.	Mercury.	Amethyst.	Purpure.		♀	Purple.
Dexter Diagonal Lines, crossed by Perpendicular.	Orange, or Red Lead.	Venetian Red, or Burnt Ochre.	Orange-Tawny.	T.	Ten.	Tenné.	Tenné.	Tenné.	Dragon's Head.	Jacinth.	Tenney.		♀	Tawny.
Diagonal Lines, both Dexter and Sinister.	Garnine, Crimson Lake, or Dark Red.	Purple Madder.	Murrey, Garnine or Crimson Lake.	M.	Sang.	Sanguine.	Sanguine.	Sanguine.	Dragon's Tail.	Sardonyx.	Sanguine.		♂	Murrey.

CHARCOAL AND CHARRING.

CCHARCOAL is an exceedingly useful article in building, as well as the other arts. It is a non-conductor of heat; and hence, an excellent packing for surrounding water-pipes, in northern latitudes, where the power of King Frost is absolute.

All piles and posts designed to be sunk in wet ground, should be charred as a precaution against rot.

Charcoal, having the property of deodorizing, is a desirable article to be used in filtration; and may be thus applied to cisterns, by means of a false bottom, and passing the water through it, on its way up to fill the cistern. In this manner every drop of water is purified; and every particle of matter left below.

In the construction of ice-houses, charcoal packed in the surrounding space, between the outer and inner walls, would tend to retain the solidity or frigidity of the ice.

In fact, there are numerous ways in which charcoal becomes a ready aid to the builder; and it would be well if its merits were a little more known; or, if known, a little more generally applied.

So it is with charring. How often,

for instance, have we seen wells and cisterns, in cellars, with the unprotected joists of the floor above them rotting rapidly, from the effects of the ever-rising dampness, which impregnates the air. This is peculiarly the case in privies; and it is not a little strange, that calculating, sensible builders will not take the trifling and most inexpensive trouble of carbonizing, or charring the exteriors of such timbers. How many fearful accidents have from time to time occurred (especially in those out-buildings belonging to school-houses) from this neglect; and yet even the Superintendent of Buildings, of New York city—armed with full authority to insure sanitary and safe building—does not, that we are aware, ever look to this matter.

What considerable trouble would there be in employing boys, to light little stick fires along a line, over which a beam might be laid, at a reasonable height, to admit of charring; and this beam turned, until properly coated on the sides requiring the precaution. In like manner, piles, shafts of pumps, gate-piers, and so forth.

THE DUROMETER.—The instrument for testing the hardness of metals, by drilling, is the invention of M. Behrens, an Engineer of Tarbes, in France. It has been thoroughly tried, and it is said that many French contracts for rails now contain a condition that they are to be tested by this apparatus. It consists of an upright cast-iron standard bolted down upon a bed-plate, and provided with a table for supporting the rail or other article to be tested. The spindle of the drilling-tool is capable of being raised and lowered in its bearings by turning a handle for that purpose, and

the drill is held down to its mark by a weight fitted to the upper end of the drilling-spindle. Its rotary motion is derived, through a pair of mitre-wheels, from a driving shaft carrying the usual fast and loose pulleys. This shaft has a worm upon it which moves a train of mechanism, in connection with a signal gong, for the purpose of indicating the number of revolutions made by the drill. The apparatus is exceedingly compact. Its use by French manufacturers has led to a gradual increase in the hardness of the rails they produce.

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THE ORIGIN OF THE POINTED OR GOTHIC STYLE.

CERTAIN it is, that the term GOTHIC, as a distinctive name for this style, is an absolute misnomer; yet it will remain the popular designation throughout the whole future career of mankind, for the same reason that the Christian appellation of Americus Vesputius and not that of Christopher Columbus was selected as a basis for the title of this continent—it was easy and immediately obtained the public ear. Both are known to have had no adequate foundation; but both are irrefragably established.

The Pointed Style is called *German* by Cæsar Cæsarianus, in his "Vitruvius," without any reason alleged. He might hold the Goths, to whom this style has so uniformly since been attributed—formerly situated on the northern borders of Germany—as a branch of the Germans; or might conceive it to have been first brought into Italy by William the German, in the twelfth century, or James the German, in the thirteenth. The former architect was engaged, with Bonanno, in A. D. 1174, to erect the bell-tower at Pisa;

and the latter rebuilt the church of the Virgin Mary, at Asissi, finished in A. D. 1218. Vasari, also, terms Gothic architecture "*Maniera Tedesca*," and pointed structures "*Lavori Tedeschi*," at the very instant he ascribes the invention of this style to the Goths. Again, some suppose it to have been called Gothic, because it appeared at the time of the rise of the Gothic dominion. Facts prove that it was derived from neither the Germans nor the Goths; but long precedes either in the history of man and art. By way of additional synonyme, we would recommend, in contradistinction to Classic, the term Romantic be applied to Gothic, for it belongs to the ages, and is nearly related to the literature, both known in modern *belles lettres* by that name.

A very cursory examination of history will show, that the Goths could not possibly have any peculiar style of architecture, or, indeed, of and through themselves, any architecture at all. They were all soldiers, and brought with them into Italy neither architects, painters, nor poets. When settled, they

made use of Italian architects; and, in their architecture, professed to follow the Roman style. Although in the church of St. Agatha, at Ravenna, there is an instance of a *pointed arch* over the head of our SAVIOUR, in a picture in mosaic; yet that fane was erected about A. D. 400; ninety-three years before the arrival of Theodoric in Italy. There are strong reasons for believing the picture to be of nearly the same time; and the architect, Gemellus, from his name, was probably a Roman. The architects employed by Theodoric, to rebuild the cities of Italy, were in no instances Goths, but we have Boethius and Symmachus, both apparently Romans, and Cassiodorus, a Calabrian, all three patricians of Rome; and Aloysius, whose exact nationality is unknown, though he was probably a Greek, or procured from Constantinople. Rome and Constantinople certainly furnished the ready-wrought marbles with which the buildings at Ravenna were decorated. Why not the architects? who, degenerate as they were—compared with those that devised the edifices whose remains they were to utilize—must have been often tempted to laugh at the incongruous piles produced.

The palaces—built by Theodoric, the Ostrogoth, king of Italy—at Ravenna, Pavia and Modena; the churches of St. Stephen's at Rimini, St. Martin's and St. John the Evangelist, both at Ravenna, the latter built by Galla Placidia about A. D. 418, and that of St. Vitalis, erected in A. D. 547; the church and monastery of *Monte Cassino*, and the church of St. John the Baptist at Monza, erected by Theodolinda, queen of the Lombards, as well as many other churches and monasteries, built by her people, and a number of Benedictine abbeys in France—are all characterized by Vasari as large and magnificent; but of architecture the most absurd.

The fact is, the Goths and the Lombards appreciated no principles in building, save bulk and vastness. Ignorance

always works clumsily and ponderously. The Goths, of the days adduced, were not merely barbarians,—a term, which, even with nations as enlightened as the Greeks and the Romans, was employed, in prejudice, to signify foreigners,—but they resisted instruction, and when, according to Procopius, it was proposed that their prince and prospective sovereign, then a child, should be placed under the tuition of skilful preceptors, they opposed and defeated it, lest, if carried into effect, it should abate his ferocity and lessen his courage.

As for the Germans, while the general world is their everlasting debtor for many an important invention, it owes them nothing for *inventing* Pointed Architecture, but a great deal for *improving* it.

Some have ascribed Pointed Architecture to the Saracens, as brought into Europe by persons returning from the Crusades. The Saracenic has indeed pointed arches, and so has the earlier East Indian, but neither displays arches identical with the Gothic, whose leading principles, besides, are discoverable in Europe long before the first Crusade took place.

When all early general cultivation of the arts, sciences and letters fell with the fall of the Roman Empire, architecture was lost. When general culture was resumed, architecture reappeared. The old spirit took the old body. Its kindred ones enlivened new forms. One of those forms was the Pointed, like all preceding, or coeval styles, a gradual elimination from the principles of applied science and adorning art. It had no particular nationality; but having been developed mainly in Europe after the rise, and for the purposes of Christianity, in addition to its other titles, it has been appropriately denominated the CHRISTIAN STYLE.

However, under whatever appellation, the Pointed Style looks equally well. Still it has been almost universally wronged, in its essential characteristics,

from the time of its last lineally educated professors, through the generations of the modern ages, down almost to the present day; and even cultured professors continually talk of preferring it, for certain purposes, on account of its being trammelled with no set rules.

This is exactly like the practice of essayers on the art of versification, who constantly speak of Shakespeare as having been a wonderful, uncultivated genius, who wrote in a loose kind of style, subject to no rules. The truth is, that William Shakespeare was one of the very highest educated men of his day—in English:—as a cultured grammarian and rhetorician equal to the very proudest and most learned of his countrymen, possessing a partial acquaintance with Latin, a pretty good working knowledge of French, and a trifle of Italian, with perhaps a tinge of Greek. If Shakespeare's forms, as read in the original edition, are now many of them uncouth and many ungrammatical, they were those of cultured English society of his generation, now outgrown, or improved; but his idiomatic grasp of our mother tongue was most absolute. His diction will never be improved upon or outgrown; and his genius can never be surpassed. As for his poetic art in manifesting that supreme genius, it was truly of the loftiest and most subtle kind, commensurate with his "faculty divine," being quite attentive to manner, though very much more so to matter; and only undiscoverable by the mass of his glossarists and glossers, because far above their ken.

Homer and Shakespeare divide the dominion of poetry between them, simply, because they were—each for his own language—the most knowing and skilful *makers*; although Homer's sway will proportionably decrease, his language being dead; while, proportionally, Shakespeare's must enormously increase, as it is now evident, that the English is destined to become the universal language in a sense no other ever

was. Homer, then, will always delight classic scholars, but Shakespeare must continue to enrapture not only these, but the entire multitude of the plainly educated, as well.

We have not entirely recovered the Greek rules for the artistic proportions of the human figure, as based upon the equations of their long-continued and accurate studies of the exterior forms of the sexes, both in all their detached parts and their individual binary completeness, but we know enough about them to satisfy us—as, indeed, mere ocular inspection of the antique statues should have convinced the world before—that their glorious master-pieces sprang from the most profound knowledge in addition to the most consummate art. The Greek sculptors have this advantage over their great poet, that they worked in a language then understood and forever to be understood by all human souls.

These considerations should long ago have taught architects and their patrons to reason thus: Here is a style—replete with beauty, loftiness and grace—which possesses an intense charm alike for the untutored multitude and the select few. It seems to be without and beyond rules: but nothing great or charming was ever yet effected in defiance of symmetry and proportion; and as we know that the best ancient Greek and Roman architects observed rules founded upon these attributes, which were lost for ages, and are not entirely recovered to this time, the presumption is, that the masters in Pointed Architecture possessed a series of formulas equally adapted for their purpose. All we know of the Classic Rules is derived from the revelations of Vitruvius and the measurements of Palladio. Let us then measure accurately, as opportunity opens; wait, with patience; and constantly and assiduously compare. In due time, if these rules ever existed, they will be, in part at least, and perhaps all, opened out to us.

But no such pains-taking process occurred to any architect; and the profession settled comfortably into the belief, that while the result was often enravishing, still the process had been entirely one of chance.

Finally—as will occasionally happen, with good fortune, to man—sheer accident brought to light, what complacent indolence had failed to find.

As before hinted, among the many commentators on the "Architecture" of Vitruvius, was Cæsar Cæsarianus, who was one of the architects of the Cathedral of Milan, circâ 1491, coeval with the discovery of America [1492.] Gwilt says* that, "as late as the year 1810, it was in contemplation to finish some parts of that Cathedral according to drawings left by him;" and that, "among the curious plates inserted in this [Cesare Cesariano's] translation, are, on folio 14, and on the recto and reverse of folio 15, [edition of 1521,] a plan and two sections of the Cathedral of Milan." Previous to the publication of Gwilt's Vitruvius, John Sidney Hawkins, F. A. S., issued, in 1813, "A History of the Origin and Establishment of Gothic Architecture, &c."† Through Mr. John Thomas Smith—for whose intended architectural work he was at the time engaged to write—Mr. Hawkins had casually become acquainted with an anonymous print, which finally led to his seeking and securing possession of Cæsariano's translation of and Commentary on Vitruvius.

Gwilt does not seem to have found any thing remarkable in the "plan and two sections" of Milan Cathedral, although he was not treating of Gothic architecture in Vitruvius, and might consider any amplification irrelevant; but to Hawkins they seem to have brought a revelation. He made them a

subject of special study; and quite reasonably claims to have deduced from them the true proportions of Gothic churches and minsters, as copied from those of the Church of the Holy Sepulchre at Jerusalem.

Of these proportions we shall speak somewhat later, merely observing that we know there must have been a set of well-ascertained and—to proficient architects in the Pointed Style—familiar rules; as, in the year A. D. 1321, while the erection of the Duomo of Sienna was proceeding, Laurentius Magri Matani and Nicola Nuti, of Sienna, and Cinus Francisci, Jone Johannis, and Vannes Cionis, of Florence, were appointed to inspect the works going on; and by a Latin instrument, dated February 17th, 1321, which Della Valle has printed at length in his *Lettere Senesi*, Vol. II., p. 60, from the archives of that Cathedral, these persons declare, as their opinion, after stating several other objections, "that the new work ought not to proceed any further, because, if completed as it had been begun, it would not have that measure in length, breadth and height, which the rules for a church require. And they further add, that the old structure, to which, as it seems, the new adjoined, was so justly proportioned, and its members so well agreed with each other in breadth, length and height, that if any part in addition were made to it, under pretence of reducing it to the right measure of a church, the whole would be destroyed."

"This passage, it is true, does not speak precisely of the proportion of the members, of which the style of architecture consisted. But is it possible to suppose, that the architects should, in one instance, have been such nice and careful observers of rule and proportion; and, when those guides had produced excellence, have neglected them in another? The contrary is the fact; and the [Gothic] proportions * * * will be shown * * * to be much nearer

* Pages xxix. and xxx. of his edition of Vitruvius, published in 1826.

† 1 vol. 8vo. pp. viii., 251 and 20, with 11 copperplates. London: Printed by S. Gosnell, Little Queen street, Lincoln's Inn Fields. Sold by J. Taylor, at the Architectural Library, No. 59 High Holborn. 1813.

the Grecian * * * than is generally imagined. The only observation necessary, on the above fact, is sufficiently obvious. If there were no settled rules of proportion, there could have been no breach of them; and the architects could not have been censured on so absurd a charge, as that of committing a crime of which, in its nature, it was absolutely impossible they could ever have been guilty. If the censure had not been just, it is very improbable that five impartial persons, as these appear to have been, should have unanimously concurred in a resolution to forfeit their integrity, and ruin their own reputations for skill, by asserting a fact, which the whole body of the professors would have known was untrue."—Hawkins, pp. 183 and 184.

A careful scrutiny of the remains of Gothic Architecture, as well in thorough preservation as in ruins, will decidedly change several very prevalent impressions.

For instance, it is a very general and a very poetical idea, that the Pointed Arch sprang from the effect, upon the minds of the original architects employing it, of the interlacing boughs of trees in the great forests of Germany. Regarded abstractly, the Pointed Arch was sure to arise early in the course of civilization from the mere inspection of the first problem of Euclid—who lived about B. C. 332—proposing and explaining the process of *raising an equilateral triangle, from a given base line, by two intersecting circles, whose centres differ in position by the length of their mutual radius*, thus forming the outline of two pointed arches, one erect and the other inverted, divided by the straight line, or radius, connecting the two centres.

It has been appositely remarked, that this double pointed curve is identical with the form, called by Albert Durer, in his Geometry, "*vesica piscium*," the fish's bladder, but apparently meant literally for a bladder in the form of a fish; and symbolically for a fish

itself; and thence, in mystic symbolism for the Church.

Regarded concretely, the exact shape of the equilateral pointed arch is found in the ceiling of at least one spacious chamber, amongst the many noble apartments of the excavated or "rock-cut" temples of ancient India, at Elora.* This, it will be objected, is not an instance in masonry; very true. We will next adduce the use of two enormous blocks of granite, adjusted to abutments below, and each other above, by being dressed up at the proper angles, and placed as many pairs as were necessary, in the manner of an inverted letter V—thus, Δ —over spaces, made to distribute the vast superincumbent weight of stone, above the chambers of the great Pyramid of Egypt.†

It is claimed, in rejoinder, that, while these answer—and, in Titanic work, answer extremely well the purposes of an arch—an arch proper requires three pieces; and here are only two: besides, that, while this vaulting is pointed, it is not curved. Exactly: we will "mend the instance." First, in pictorial art; and then in stone.

We have from Hawkins, in a compartment of a mosaic picture, in the Oratories of St. John the Baptist and St. John the Evangelist, in the Lateran Church at Rome, a representation of a moulded straight arch, identical in shape with that cited, as found in the pyramids of Egypt. Another compartment in the same subject exhibits a curved, pointed arch-head, ornamented with rude scrolls, interiorly and exteriorly, which would readily suggest the use of crockets. This arch and an enclosing obelisk are based upon a pedi-

* See Capt. John B. Seely's "Wonders of Elora," 1 vol. 8vo., pp. 566. London: G. & W. B. Whitaker, 1824. The plate of the long, *pointed vault*,—which springs without intervening capitals from square piers having no pedestals, and which has on each side open aisles with *flat* ceilings,—occurs at p. 185.

† The Pyramids of Gizeh. By J. E. Perring, C. E. Explorations for Col. Howard Vyse. 3 vols. Oblong elephant folio. 57 lithographic plates. London: James Fraser. 1840.

ment angle, which would as readily hint the Tudor arch-head. Ciampini says this mosaic was done by command of Pope Hilary, A. D. 462.

We find in Ciampini* a view of the entrance to the Oratory of St. Thomas the Apostle, built by Symmachus, in the Vatican Church at Rome. This entrance contains curved pointed arches, in altitude midway between the early Gothic and the Tudor. Symmachus, elected Pope in A. D. 498, died in 514. He was a great rebuilders and restorer of churches. There was also an architect of the same name, who died in 526. As far as time is concerned, it is immaterial which of these is intended in the record.

Ciampini† also gives the form of a painted window in the Basilica Siciniana, afterwards called St. Andrew, in Barbaro. It was one of the great south windows; and had been blocked up by a wall, to prevent the too great immission of light. The themes are the crucifixion of St. Peter, and the martyrdom of St. Paul. The painting is very ancient; the dresses of the fifth century, and the picture itself—conjectured to have been wrought by order of Pope Simplicius, who put up the mosaic work in the tribune of the same church—from the peculiar characters of the writing over it, is estimated to date not much later than A. D. 600.

The pointed arch appears in veritable masonry, upholding itself and superincumbent weight, in the Dome [Duomo] at Pisa, in Italy, erected A. D. 1016. It was a vast undertaking for that age, as the body of the church consisted of five naves, and was composed of marble within and without. This fane, from the designs of Buschetto of Dulichium, a Greek architect of great skill, was constructed of the spoils of other buildings, which the Pisans, then at the height of their greatness, had imported, by sea, from several distant places

abroad, as is plainly evinced by the cornices, columns, bases, capitals, and other worked fragments. As these materials were of a great variety of sizes, Buschetto, in accommodating them to each other, and settling the proportions of all the parts of the pile, which is extremely well disposed, inside and out, exhibited much science and judgment. Perhaps, of all possible instances, this Dome of Pisa is most pertinent to our subject, for the vaultings of the side aisles of the nave are precisely of the sort termed by the Italians *volta di sesto acuto*, that is, built with the pointed arch.*

We have the Pointed Arch, again, of real masonry, in the vaulted ceiling of the Chapel of the Angel, contained in the vestibule of the Church of the Holy Sepulchre, at Jerusalem; and curiously enough, the arch of the dome of this church, supported on four large, clustered columns, Pointed-minster fashion, is not struck in a semicircle, as might be supposed from its period—not later than A. D. 1048—but entirely coincides, as has been ascertained by dividers, or compasses, with the Gothic arch a little rounded at the top. The vestibule of this church, likewise, indi-

* "The church or dome [duomo] of Sienna, consecrated by Pope Alexander III, in A. D. 1180, and, consequently, begun several years before, has a reticulated vaulting of pointed arches unequal in size. Della Valle, Lettere Senesi, vol. ii., p. 17.—Whittington, p. 87, speaking of the Church of St. Germain des Prez, erected about A. D. 1000, says the arches at the eastern end, [chevet, apse, or tribune,] are pointed in consequence of the arrangement of the pillars, which, being nearer together in the bow than where the colonnade proceeds in a straight direction, the arches which rise from them, when brought to an equal height with those of a round shape, become necessarily pointed; and this is among the number of instances where the pointed arch was used from accident and necessity, before it became an object of taste. He observes, further, that the same circumstance occurs in the crypt of St. Denis, Paris,—the chevet of which was finished A. D. 1144. See Part ii., c. 3,—in the choir of the Church of La Charité sur Loire, France, put up towards A. D. 1100; and at the east end of Canterbury Cathedral, England, built between 1180 and 1185, where the arches are, some circular, others mitred; for the distance between the pillars here diminishing, gradually, as we go eastward, the arches being all of the same height, are mitred, (i. e., pointed, [or shaped like a bishop's mitre,]) to comply with this fancy, [the fancy itself having probably arisen from the architect imitating some building conglomerated of ancient fragments:] so that the angles of the eastern ones are very acute." Gosling's Canterbury, p. 224." See Hawkins, pp. 125 and 126.

* De Sacris Edificiis, plate 22.

† "Vetera Monumenta."

cates another feature of sacred Gothic architecture—namely: the open arched side aisles—as it has two open semi-circular arcades, one above another, springing from a circular ground plan; the arches of the first story one thrown, without sensible division, from three pairs of piers, on as many sides, and, intermediately, from pedestaled and capitated pillars, in two groups of three each, and two others of two each, all the piers and pillars being about the same distance apart; and the arches of that in the second tier being in eight pairs, the supports—alternate plain piers and capitated pillars—rising directly from the intermediate string moulding, without pedestals; the whole surmounted by a third, surface tier, struck from simple pilaster piers, rising from a string course, the arches being also semi-circular and their curved lines melting imperceptibly into the vertical ones of the piers, the whole entirely without ornament. Here, it will be observed, were circumscribing walks, which only needed straightening to become Gothic aisles.

A little later, the pointed arch is found in the Baptistery of St. John, at Pisa, erected, according to Vasari, in A. D. 1060; but Della Valle says, in A. D. 1152. This single edifice furnishes the types of the Norman-Gothic semi-circular doorway and simple—that is, not interlaced—surface pillared arcade; twin semi-circular arches upon pillars, stilted, canopied by cusped trefoil arches, finished with acute, crocketed gablets having statue finials—the whole forming a second-story, open arcade, admitting two men abreast; and, therefore, although on the outside, containing the conception of the cloister. Over this arcade is a course of deeply recessed semi-circular windows with drip-stones, very Norman-like in appearance, with immediately above each a moulded circle, containing a quatre-foil within an encompassing lancet gablet, each ter-

minated by a statue,* and ornamented with mouldings continuous with a horizontal string-course, interrupted only by themselves, which crosses angle-advanced buttresses, separating the windows corresponding to every three of the arcade pillars below, so that the two sets of gablets correspond as three of the upper to every four of the lower. Above the string-course the buttresses terminate in turrets with fretted or interlaced cusped gablets and finials. The body of the baptistery is separated from the semi-globular dome covering it, by a continuous moulding composed of Grecian pediment angles, whose apices are immediately behind those of the lancet gablets. In the dome itself, just above the eaves, are a number of trefoil apertures, or windows, each covered by a pillared, cusped and pinnaced canopy. Between the canopies are crocketed ribs, which unite at the summit of the dome. Every three canopies correspond to every four lancet gablets. In this one pile, then, whilst we do not obtain the pointed arch, we have the plain cusped archlet and almost every other main feature known in later erections, as Gothic of different modes, yet exhibited in such a way as to show their close relationship to, and immediate derivation from the debased Roman; just as, in another region, the Byzantine gradually grew up from the same source.

We come now to an important object in this inquiry, the *Church of the Abbey of Clugny*, in France, re-erected upon the same spot once or twice, but not rebuilt subsequent to A. D. 1093; and not only in existence, but well preserved, down to the days of the French Revolution, during which its materials were sold, for a trifling sum, to General Santaire, who had destroyed the west front in 1801, and most likely demolished the whole of the fine old building

* These statues, not particularly noticeable in the other great Gothic structures, reappear with a multitudinously magnificent development in the Cathedral of Milan.

shortly after. The diminished engravings, whence we have our data, are from Hawkins' "History of Gothic Architecture."

This church is an unmistakable instance of the use of the Pointed Arch, which occurs as a special characteristic of the structure, both in the vestibule and, far more significantly, in the nave. "All the arches, on each side, of the vestibule are pointed and rest on piers formed of Corinthian pilasters; and the whole of the nave, on each side, is also composed of a long range of piers, consisting of Corinthian columns, supporting, in like manner, ten pointed arches on each side." It will be understood, of course, that both the vestibule and the nave have, between these pointed arcades and the side walls, open aisles with vaulted roofs. The vestibule has an oblique-groined intersecting-segment ceiling; and the nave a semi-cylindrical one, cross-groined from the capitals of slender pillars projected above the capitals of the piers. In both cases the clerestory division of the walls is formed of two ranges of semi-circularly-arched windows, those of the vestibule single above and double-twinning below, for every large pointed arch; and those of the nave, in both tiers, arranged in groups of three single ones, for every large Gothic arch. In the remainder of this most interesting building, the Roman arch and the niche arch prevail. In addition to oblique transverse groinings, this erection contains the germ of the slender, banded, Gothic pillars.

"The circular window at the end of each transept, in the later Gothic cathedrals, might possibly be derived from a very large carving of stone, representing a circular rose, in the west front of the Abbey-church of Clugny, as the ornament—evidently intended only to fill up the space over the portal, and between it and the summit of the building, which would, otherwise, have appeared too naked and vacant—is so like

such a window in form, and occurs so very nearly in the same situation."

This Church of Clugny was no petty example. In the absence of exact measurements, we deduce—from comparison of the human figures, introduced into the views, with adjacent portions of the edifice—that the arches both of the vestibule and the nave must have been about fifty feet high; and the vaulted ceilings, in both cases, about a hundred; the church itself manifestly having been between four and five hundred feet long.

Henry of Winchester—who had himself been a monk in the Abbey of Clugny—a few years later, A. D. 1136, built the Church of the Hospital of St. Cross, at Winchester, containing the earliest known instance of the Pointed Arch in England.

It is well known, that, after the division of the Roman Empire, neither the Empire of the West, nor the Empire of the East had sufficient vigor and cultivation to copy the choice edifices then standing, much less to produce any design architecturally new; and, that, presently, both so far declined, as not even to compass any artistic details. The Northern barbarians made one incursion after another, each further injuring the architectonic remains of former generations, until, from the insecurity of war, none but a few churchmen thought of cultivating the arts and sciences; and these, in preference, as easier, and requiring little beyond personal ability and industry, directed their attention to ancient literature, which needed no patrons. But patrons were essential to architecture, and it had none. Finally, when the Western Empire had merged in the rude kingdoms of the Goths, Lombards, Vandals, &c., new structures were needed for shelter, defence, and worship; and the old ones, whether preserved or downfallen, were used as quarries. It required, of course, some mechanical skill to adjust these

discordant materials; and in interiors, where many larger and smaller antique columns were requisite, to upbear weight, the purpose could only be effected through arches. The materials being scarce, as well as unrelated, it was often an object to run the arches, whether from taller or shorter pillars, to the same height. The shorter pillars would, of necessity, be closer together than the taller. If then the taller had semi-circular arches, the shorter could only have arches, at all, by condensing them laterally, in other phrase, either by stilting them, which consists in placing block upon block, from the capital of the pier or pillar upwards, until the requisite altitude is attained, when the arch is made semi-circular from the two uppermost blocks, or by making the arches pointed, when their keystones could be got to harmonize in horizontal range with those of semi-circular arches. It will be felt from the preceding facts, that not even this theory is needed, as, sooner or later, the pointed arch must arise from geometry; but this method is known to have been used; and would produce what later writers very plausibly claim for it.*

Where original materials, and not fragments from former edifices, were employed, the intermixture of the pointed arch with the semi-circular one, in the same building, not unlikely arose from the inaccuracy of the workmen, who, not observing the correct measures in the other parts, and exceeding the due extent, were constrained, in order to make the whole elevation suit the foundations, to place some of the columns nearer each other than the due distance. Hawkins says, that whoever will take pains to measure the extent of arches and dis-

tances between columns in some of the Gothic minsters of England, as was done for his book, will find a great difference in those spaces, which appear to the eye to be the same; and that the principles of the two sorts of arches are not so very dissimilar, as the semi-circular arch is, as its name implies, half a circle, while the pointed arch was and is constructed of two segments of a circle.

The Church of the Holy Sepulchre also contains clustered columns or pillars, a distinguishing trait of the Gothic style, doubtless derived from this edifice, always an object of high interest, and, in those days, of great veneration, which circumstance would cause it to be imitated continually. The original idea was derived from the mediæval generally received opinion "that the stem of the palm, if loaded with more than it can support, will not swerve from the upright, but resist the weight, and endeavor to bend upwards."(!) A plausible cloud is sometimes as efficient as a demonstrable reason. In reality the palm is strong for its bulk and very elastic. Tall, and with a graceful flowing top, it was and remains a conspicuous object in Palestine, where there are no trees of any bulk for timber. The trunk of the palm is of the same size all the way up; and a number of palm stems, bound together at intervals for an increase of strength, would give exactly the appearance of a Gothic clustered pillar. In fine, it was natural for Eastern architects to imitate the trees of their own country; and it would be quite as natural for European Christian architects to imitate those of the Holy Land.

So far we have spoken of plain, or early Gothic. Bishop Warburton conjectures, as have, in effect, a number of others, that Gothic originated with the Visigoths, in Spain, and was derived from the impression produced upon the imagination of the architects, by contemplating the intricacies of figures formed by the perspective of the branches in groves of trees. This shows him to

* We have seen, within a few days, a second-story side addition to the residence of a gentleman in this city, constructed not many months ago of wood, in which the carpenter to avoid using more than four posts, has represented the distributing supports as a *segment* arch upon the side and *pointed gothic* arches at the end. This probably being a late spontaneous example of the process in question, its constructor, not unlikely, never having occupied himself with the history and theory of styles.

have had in mind the later, or luxuriant Gothic, distinguished by tracery; but the Visigoths were driven out of that country, A. D. 713; and prior to that no luxuriant Gothic existed anywhere.

An idea once formed in the brain of an architect, might be expanded by the contemplation of a grove or forest. Both the Egyptian and the Grecian columns are referable to the trunks of trees; the trunks considered not as growing but in the form of timber. It is indeed a much more tenable, nay, an almost impregnable position, that amongst all peoples the more permanent structures of stone are direct imitations of the more perishable ones of wood. In this view, the Gothic, fairly deducible from geometry, might possibly, also, spring up, independently, in the minds of Northern architects, considering and imitating the framework of acute timber roofs. We know, that a good kind of rustic Gothic, with tracery, is made out of undressed stems, branches, sprays, and cones of the various evergreen trees, in direct imitation of luxuriant Gothic. Things like these always have acted and reacted upon one another, and always will.

It is claimed by many writers that luxuriant tracery originated from the gradual increase in the number and variety of minor windows, thrown in as ornaments through the shape of the light they threw; so that, in process of time, the wall above the main window was pierced to such an extent, that the architects next resolved upon employing the separations themselves as adornments, and hence tracery. We will not entirely controvert this, as there is, in all likelihood, a portion of truth in it, especially as regards geometrical tracery which was both the earliest and the latest form; although the flowing, or flamboyant, could not originate in this way, and we do not think the other did. Both kinds of tracery probably grew up from the intimate knowledge of linear harmony, commensurate with the constantly increasing general science of the

architects, until the Gothic sentiment was thoroughly eliminated; the geometrical tracery, from proficiency with the dividers, and the flamboyant from mastery of freehand drawing. And never till the "lamp of sacrifice" is again most lavishly burnt, in sacred architecture, can the world expect to see any improvement on the choice specimens of original work fortunately yet extant.

"The extreme intricacy and luxuriance of the tracery work, which often occurs in Gothic erections, was the consequence of that love for exuberance of ornament and decoration which had been increasing from the time of Constantine downwards, and was so conspicuously shown in the Church of Santa Sophia, at Constantinople, some part of which may justly be concluded to be of the age of Constantine, and the rest, but by no means the greater portion, of the time of Justinian."—[Hawkins, p. 147.]

It is observable that, whatever in this general style was newly devised in one region, was presently copied or imitated in another at a distance, and some have expressed surprise at this fact; but the monks were constantly traveling, on the concerns of their convents, from one religious foundation to another, were welcome to both cleric and layman everywhere, and their persons were respected and their comfort was assured in a very stormy and insecure period. Besides being the theologians and historians, they were the scientists and the architects of the time; and what was known to any one was gladly diffused among his willing brethren. The general councils of the popes also brought together many distinguished scholars. Then itinerant companies of masons were frequent. Aubrey,* on the verbal authority of Sir William Dugdale, mentions that about the time of Henry III., of England, the pope granted a bull or patent to a company of Italian architects to travel from place to place, and build churches.

* Antiquarian Repertory, vol. iii., p. 45.

Sugger, abbot of St. Denis, France, was one of the most intelligent and capable architects of the twelfth century. He caused the church of St. Denis to be rebuilt and enlarged, and himself took the principal conduct of the work, which he began in A. D. 1140, and finished in less than ten years, with extraordinary magnificence, as his own descriptions will witness. To him is probably due the introduction of stained glass into sacred edifices, or at least the revival of a former rare practice. This was likely necessary rather than optional, when the more slender and open variety of Gothic was adopted, to obviate the inconvenience of too much light, from the number and size of the windows.

The Church of the Holy Sepulchre, at Jerusalem, is universally acknowledged by the authorities to have often been taken as the model for Gothic cathedrals. Its plan, like that of the *Duomo*, at Milan, consists of two equilateral triangles, placed base to base for the length, and one placed base to side for the width. In the exquisite cathedral just named the height of the body of the church is the same as the width, without including the transepts, and the height of the finial of the spire of the central tower is twice the width of the nave of the church, including the side aisles. The piers, supporting the central tower, rise from a square whose side is one-third the width of the nave, including the side aisles. One side and a half of the square of these piers determines the distance of the transept walls, with two columns intermediate on each side, thus giving, in transverse section, the great arch of the central tower, with three arches of half its base on each side of it, or seven arches in all. There are three of these smaller arches, size as before, in the tribune, or head of the Latin cross of the ground-plan, in the same line with the nave. The nave itself counts four central tower squares and a half in length, and therefore has, longitudinally, nine arches of half the base

of those of the tower. The outer aisle of each pair is half the height of the body of the nave or that of the church itself. The vaulting of the tribune and the transept is of the same size and height as that of the nave. The central open space of the nave, tribune and transept in the ground-plan show very distinctly the form of the Latin Cross, the "Cross Passion" of heraldry, and the popular "Plain Cross," or "Church Cross;" that is, a long limb, with a shorter one crossing it at right angles, the projection of the shorter limb being just the length of that portion of the longer limb running beyond the shorter. This form is never so obvious on the outside of any such edifice.

For the rest, many minor matters, and the demonstration of those here given, we must reserve for an article on *GOthic DETAIL MEASUREMENTS*, with *DIAGRAMS*, merely calling an instant's attention to another ancient pile, the Church of the Nativity and Manger, at Bethlehem, which Bernardino calls "the beautiful and venerable church erected by St. Helena, and dedicated to the Virgin Mary." This exactly corresponds with many Gothic edifices in several particulars, especially with the cathedral of Milan, in the number and distribution of the side aisles of the nave; being also exactly two equilateral triangles in length and one in width.

We see, then, that the claim of there having been *An ample and adequate Set of Rules for the Proportions of Gothic Church Edifices*, is fully borne out. Whether we shall ever entirely regain these rules is another matter; but there is hope. At the same time, the position, *That much Greater Scope for the Display of Original Genius, in the Varieties of Expression, resides in the Gothic, than in the Classic*, is also absolutely true. But the element of high cost—always attendant upon choice specimens of classic architectural beauty—is even more a necessary accompaniment of lofty Gothic art.

DESCRIPTIONS.

DESIGN FOR A CITY STORE.

STYLE: FRANCO-VENETIAN.

WE give here, by way of illustration, a DESIGN FOR A CITY STORE, the prevailing characteristics of which partake of the Venetian style of architecture, characterized by its pre-eminent lightness, fitness, and, more especially, by the close proximity of the windows, and the large proportion of the elevation occupied by apertures. One of the main points in which Italian architecture differs from any other, is its predilection for fenestration, or the introduction of windows, so as to form a marked feature in the design.

For the purposes of a store, wherein light is an indispensable object, this peculiarity is of special importance. In some buildings of such style, this trait is carried to an extreme, so that, with the windows and the external embellishments, there is but little space left for the mere walls.

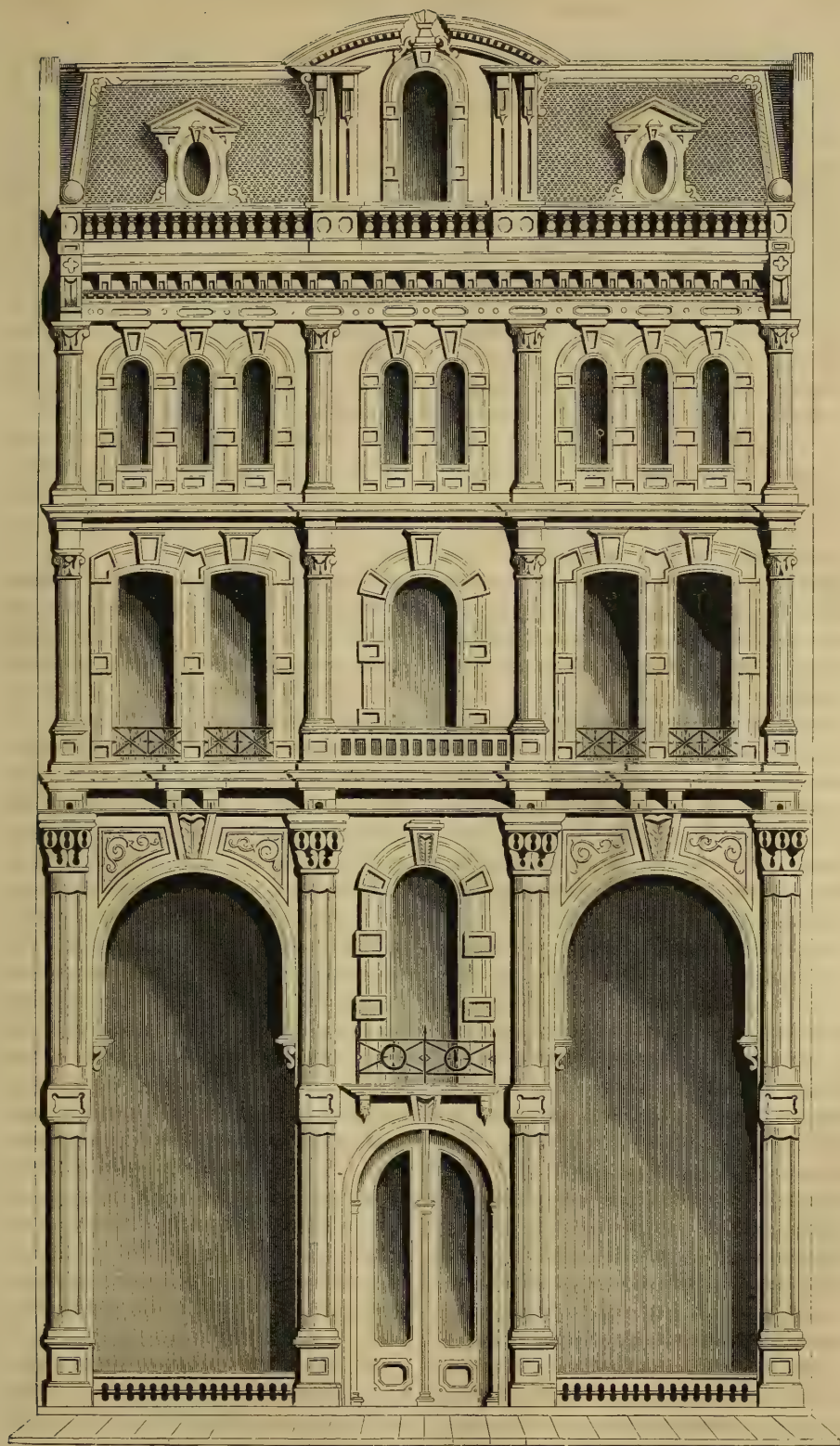
Fenestration is, in some degree, irreconcilable with columniation, as the former either interferes with the effect intended to be produced by the latter, or reduces it to a secondary place in the design. Used as a means of ornament, columniation united with fenestration has been employed, however, by the Italians, in many of their most beautiful edifices, with striking and very advantageous effect. In the scheme before us, the two have been so combined, one as an accessory to the other; and the object aimed at has been to produce an edifice possessing elegance and taste.

This front is intended for a RETAIL STORE; and from its novelty, lightness, and grace, would contrast most favorably with the generality of such struc-

tures, and form an ornament to our streets. It is, as will be seen, four stories high, with a French roof in which is an attic story.

The most striking peculiarities of this design are the large front windows that extend the full height of the first and second stories for the purpose of allowing a greater display of goods to be made, giving a larger scope to the taste of the owner, in this respect, than is obtainable in the comparatively smaller space usually allowed in the present mode of constructing store windows. They are enclosed, above and below, on the inside with glass; and so arranged as to be accessible from both the first and second floors, for which purpose the joists are trimmed round, and thus a clear height is obtained. In the centre, is the entrance door, furnished with a vestibule, the height of the first story; and the joists of the second floor will extend out to the front, giving access to the window, which is immediately over the portal, and opens directly into the second story, forming a gallery the depth thereof, in order to give greater advantages for the display and arrangement of the interior fitting-up and decorations. Before this window is an ornamental iron balcony, which gives a character to the door and front. The different stories are divided by prominent and highly moulded string-courses, through which the columniation is continued.

In the third story, there are in front, with segment heads, two twin-windows, flanking a single one, with semi-circular head, between them, the latter having a



FRANCO-VENETIAN CITY STORE.

stone balcony and the others iron ones in front.

The fourth story, in the centre, has a twin-window, and on either side, a triple-window, all having semi-circular heads and stone panels.

The fifth story, or attic, in the French roof, has, in the middle, a semi-circular window, enriched with a broken pediment; and on either side, a small oval-window, to give greater variety of aspect, through the form of the roof. Along the whole front of this story runs

a graceful and ornate stone balustrade.

The different balconies; the circular-headed windows; the columns, with their carved caps; the ornamental and projecting keystones, extending up to the string-courses—all combine, with other parts described, to form a *tout-ensemble* of unusual lightness; and designed to appear imposing, without being costly or ponderous; and to possess richness of effect, without any excessive outlay.

A TUDOR MANSION.

THE Tudor style of architecture, considered in a general sense, is that which came in vogue during the Tudor dynasty in England, in the earlier part of the sixteenth century, originated and fostered by Henry VII.'s policy of diminishing the power and influence of the Barons through bringing forward and elevating men of hitherto unknown families. This excited a mutual emulation to excel; not, as heretofore, in the feudal days, by the number of their followers, but in the elegance and splendor of their mansions. It will be observed, however, in the earlier days of this style, that the nature of society, and the customs of the age, still required these edifices—palaces, baronial halls, and manor-houses—should be so constructed as to be calculated for defence, if necessary. This particular feature in the style, which may have been, however, partly retained as an ornament, gradually disappeared; and, during the later years of its existence, is not visible in any of the examples still existing.

The better to examine this style, it may be divided into three periods, the characteristics of which are quite distinct, although all modifications one of the other. First, we may give the style as existing in the time of Henry

VII., the peculiar traits of which were the bay-windows, turrets and battlements; the turrets being surmounted by bulbous domes, the latter, in form, essentially Russian. But little is known of the buildings at this period of history, beyond a view, and a pretty full description of the "Palace of Sheen," near Richmond, built by Henry VII., himself, which are to be found in "Speed's Theatre of Great Britain." It appears, from the conglomeration of turrets and bulbous cupolas with which it abounded, to have presented somewhat the appearance of an Arabian palace, or an Oriental mosque.

Later on, in the sixteenth century, in the following reign, that of Henry VIII., a great impetus was given to domestic architecture, the king himself personally setting an example, by building and repairing no less than ten mansions, in different parts of England. His lead was nobly followed by his courtiers, among whom Cardinal Wolsey may be named as the most distinguished. To him we are indebted for Hampton Court Palace, Whitehall, the Episcopal residence at Esher, Surrey, the College of Christ Church, at Oxford, and one at Ipswich. A large number of sumptuous and stately edifices were erected by

other nobles, many of which are still to be found, nearly all in ruins; but occasionally, one perfect. Among the most striking peculiarities in this style, we may enumerate the gate-houses, the beautiful bay and oriel windows, gables with pinnacles, the numerous turrets and chimneys, and the roof. The projecting windows form a very beautiful and novel feature, and are of two kinds: the *bay*, rising immediately from the level of the ground; and the *oriel*, projecting out in the upper part of the building, than either of which there can hardly be conceived an architectural form which has a more enlivening and brightening effect in the interior, or a more attractive and ornamental appearance on the exterior. Both these kinds of windows are constructed in different forms, semi-octagonal, rectangular, semi-circular, &c.; and could, if desired, be carried up through several floors. Oriel windows are very general throughout all the mansions erected in this reign. Cardinal Wolsey's palace, at Hampton Court, was a perfect specimen of this style, as it existed in his day, before it was altered to its present mixed condition. Previous to the reign of Henry VII., the roofs of edifices had been formed flat for the purposes of warfare; but, with that monarch, the feuds which had so long devastated England, between the rival houses of York and Lancaster, ceased; and, with the prospect of a long and continued peace, men began to prefer elegance and beauty to strength, and comfort and convenience to the sense of security against attacks. Hence the first approach to an attempt at beautifying their roofs was to conceal them, to give the building a castle-mansion appearance. But it was not till Wolsey erected his palace, that gables, pediments, pinnacles, and, above all, the most peculiar characteristics of this style, clustered chimneys, first made their appearance. These latter deserve particular notice, for, up to this time, chimneys of any description had been

rarely used. Now they not only came into very extensive application; but were made particular subjects, in the construction of a building, for display and ornament. They were usually of lofty proportions, standing out in bold relief; and in forms frequently picturesque and curious, resembling groups of small columns, with pedestals, plinths, bases and capitals; the shafts embellished with mouldings of lozenges, roses, fleurs-de-lis and other ornaments. Indeed, no amount of ingenuity and skill seems to have been spared on this feature, hence it is one of the peculiarities and characteristics of the Tudor style. The windows, both in this and in the preceding reign, had all low obtuse Gothic heads, which have been, and are still termed the "*Tudor arch*," each divided by one mullion, with a cross transom, and having a label moulding over the head.

The third and last division of this style, what is known as the Elizabethan, we must pass over with only a very brief description, as it will form the exclusive subject of a future sketch. In the reign of Elizabeth, at the close of the 16th and commencement of the 17th centuries, there was no material difference in any of the characteristics, only they were made much simpler and plainer. The battlements along the ridges of the roofs, hitherto retained only as embellishments, altogether disappeared. Square heads to the windows took the place of the Tudor arches, and the windows were divided by more mullions and a cross transom to each. The attic windows were formed by acute triangular pediments, having brackets and pendants crowned with pinnacles and finials. The subject of our description, of which we have given a plate, rather blends the characteristics of the times of both Henry VIII. and Elizabeth; but the former in a much greater degree, as will be seen by comparing the design with the foregoing brief remarks. The prevalent and most strik-

A TUDOR MANSION.



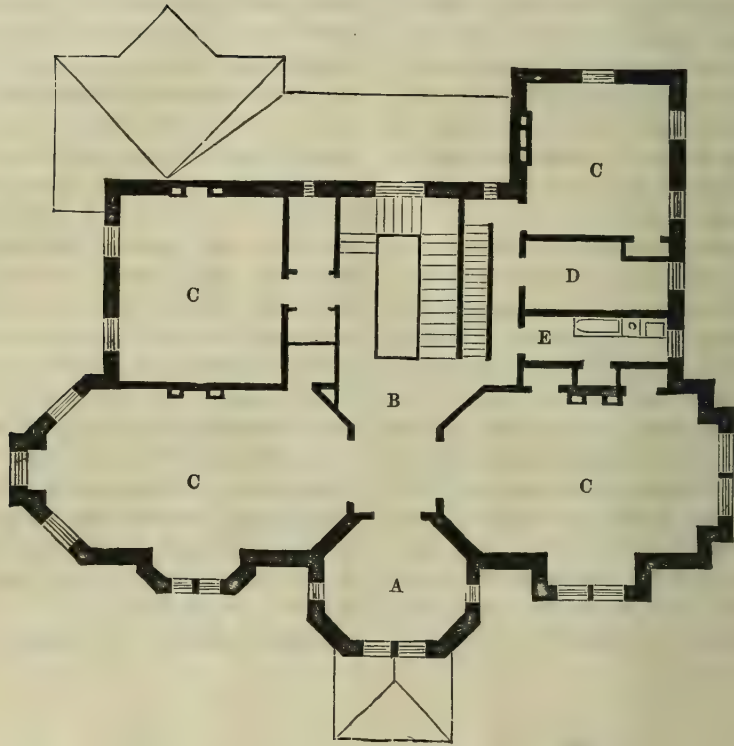
ing peculiarities of this style are its outlines and masses of vertical and angular forms, with gables, oriels, pinacles, and high, beautifully varied, clustering chimney-shafts. It has always been considered appropriate for country residences of any considerable dimensions; and there is nothing in any of its forms or details but may be readily adapted to every modern convenience and luxury.

The main entrance is through an octagon vestibule at A, which is 12 feet in each direction, with a passage 8 feet wide, leading to the stair-hall D, which, at this point, is again widened to 12 feet, and contains the main stairway. B is the drawing-room, 16 feet wide by 30 feet long, with octagon ends, a square projecting window at one end, and folding-doors, to match in width, at the other. This room has also a bay-window on the front, which is of larger dimensions than the other; and adds materially to the space in the room. C

is the dining-room, of the same width as the drawing-room, and 28 feet long; with square projecting windows on the front and end, both of considerable dimensions. It has also folding-doors, opening into the passage, exactly opposite, and in range with those of the drawing-room, by which means the whole range of the front is connected, with bay-windows at either end. The mantels, in each of these rooms, B and C, are on the side; and opposite the front bay-windows. D, as before stated, is the stair-hall. E is the library, which communicates with the drawing-room, and with the office F, on the rear, and also with the hall; the library is 15 by 17 feet; the office, F, is 13 by 18 feet. G is the kitchen, 15 by 18 feet; H, the china-closet, communicating with the dining-room, kitchen and hall; I, the private stairway; J, the front porch; K, the water-closet; L, the coat-closet, and M, the rear porch.

The second story will contain a cham-





ber, A, over the vestibule; stair-hall, B; four chambers, C C C C, and a store-room, D; bath-room, E, and wardrobe closets, as indicated.

The attic, which is a full story, will contain the same number of chambers, store-room, and servants' bath-room.

The bay-windows are all carried up through two stories, forming alcoves to the rooms on the second story, corresponding with those on the first-story.

The vestibule is carried up, and forms a tower, with an oriel window projecting from the third story. The upper section of the tower is curved, and covered with slate, varied in form, which should also be variegated in color.

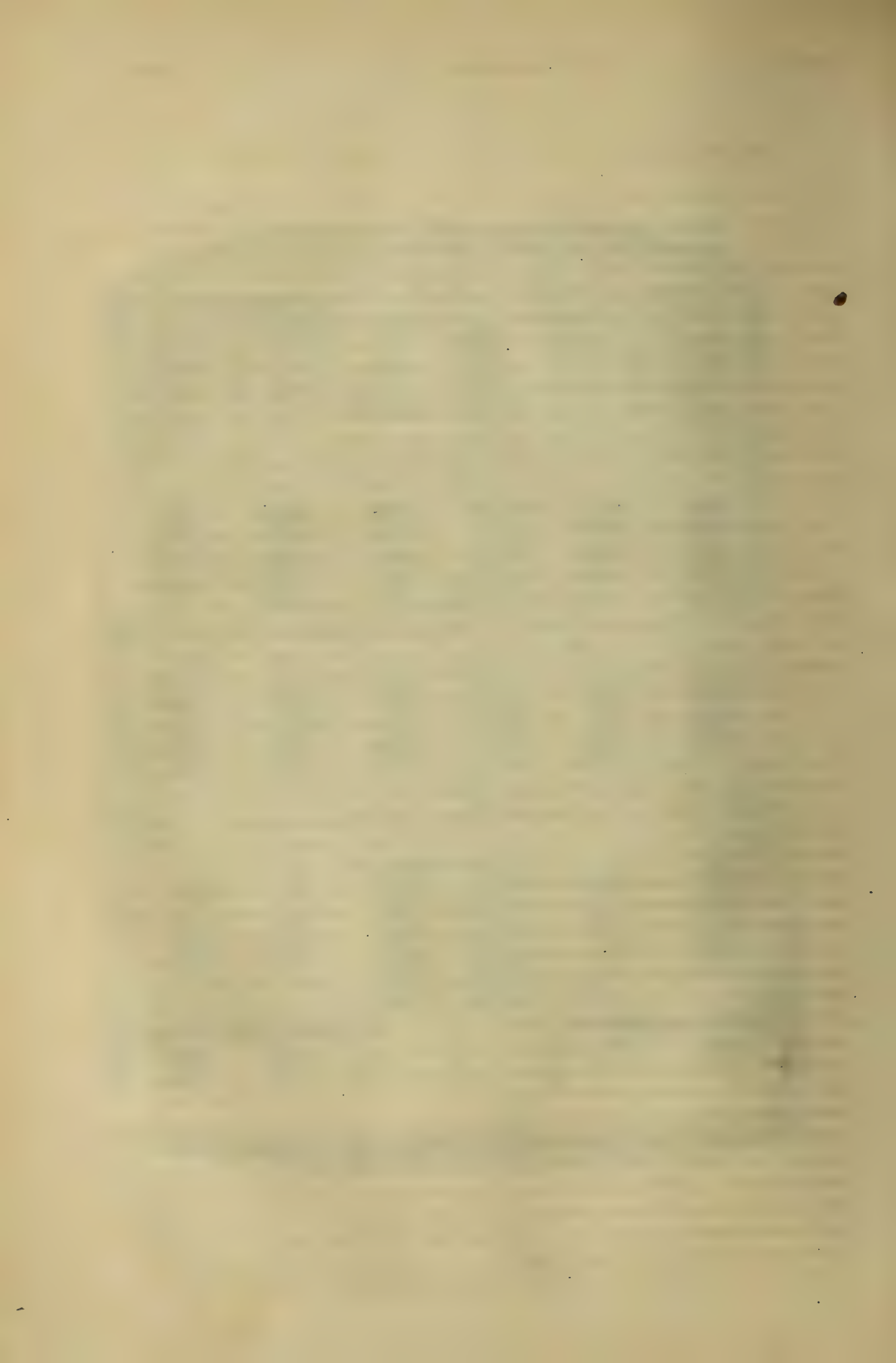
As will be perceived, this design has

all the leading features characteristic of the style portrayed and adapted, as far as has been deemed practicable, to our modern requirements and our more refined habits of life. Our endeavor has been to combine modern arrangements with elegance; and to present to our readers a design for a structure, which not only possesses a striking and imposing external appearance, but which, in the internal disposition of rooms, will be found to provide for all the requisite comforts and conveniences of a family of ample means.

A building erected in accordance with this plan and design, and fully carried out in all its details, will cost from twenty-five to thirty thousand dollars, (\$25,000 to \$30,000.)



TWO ADJOINING CITY RESIDENCES.



TWO ADJOINING CITY RESIDENCES.

ON this plate we exhibit a design for two dwellings, such as are generally built in blocks, for the entire length and breadth of a square; but so arranged that the doors are formed in pairs, in order to obtain uniformity of finish in these special traits of the exterior of buildings, the door being the most prominent feature of the house.

In cases where the messuages are built single, with the entrance on one side, there is very rarely sufficient width in the hall to admit an exterior dressing around the entrance door, which, in such case—treated separately, and often without any reference to the adjoining doors—produces a want of conformity and uniformity. Where they are formed in pairs, we have the advantage of so much additional space, thereby gained, which enables us to originate a design combining fitness and due proportions.

In the instance now before us, we have just such a case. The doors are in juxtaposition; and the dividing line between the two properties is the centre of the middle feature. Thus, though there are two distinct portals to two separate residences, the general outward effect of the finish is such in its combination that the attention is attracted from that fact; and they appear to be but a single entrance. Another characteristic of this design, and one which assists considerably in producing this effect, viz., the appearance of there being but one door, is the arrangement of the front steps, presenting, as it were, but one flight, with a massive curved stone hand-railing and newel-post on either side, and only a narrow and scarcely perceptible stone course—usually termed a division-stone—down the centre, forming the line of demarcation between the two houses.

The style of our design may, with some degree of propriety, be termed

Italian, partaking, as it does, in its general leading features, the characteristics of that favorite, always noble and welcome. It is intended to be constructed of stone, although brick could be substituted, but not without detracting considerably from the effect.

From a glance at the plans of the first and second stories, which we have likewise here presented, the design will at once be recognized as that of what is widely known as, *par excellence*, a “Philadelphia house,” to which divers facetious individuals, as well of our city as of other places, sometimes accord the *soubriquets* of the “Pan-handle,” and “Frying-pan” domicile. The peculiarities in the construction and internal arrangement of this particular class of dwellings, which, we might almost say, has become of universal use in our city squares, depend upon the circumstance of the extreme narrowness of the front of the lot, usually apportioned for the purpose in a closely built city, only admitting on the plan a single room in width, exclusive of the hall. This necessitates the extension of the building towards the back of the lot for the other apartments. The back building is, in almost every instance, only two-thirds the width of the front portion. Thus, when the latter is 25 feet in width, the former will be about 16 or 17 feet only, leaving what is popularly called a “side yard” of eight or nine feet in width; but which can only be considered as an open alley, which extends back a depth of from 30 to 40 feet. To these alleys the sun-light seldom if ever reaches; and there being no circulation of air through them, in the generality of cases they are damp and covered with green mould. It also allows a space of only sixteen feet at the most for light and air, to the two houses, certainly not sufficient to diffuse the full light of day,

and rather inadequate for true healthfulness of air. The back dwellings are never further apart than the distance just specified; and frequently even this is much reduced where the allotment for the front of the lot is narrower than that on which we have been basing these remarks, viz., 25 feet. We need hardly here dilate on the utter absence of comfort, and, above all, of privacy, which, of necessity, such a system involves. This must be at once apparent to the most careless observer. But still, with all these disadvantages—and they of no insignificant a character—this plan of construction evidently possesses some attractions—some charms—which compensate for all the drawbacks we have hinted at; since fully three-fourths of the city of Philadelphia is built in this manner. One, we must presume, is *habit*, long residence in homes of this particular style, and acquired familiarity with, and fondness for, the internal arrangement of the rooms consequent thereon. Another—but, in our opinion, very objectionable—perhaps, may be, that it allows greater internal privacy, the chambers not necessarily opening into or being accessible, one from the other, and the upper back rooms of the building being entirely separate, and having distinct entrances, from the front rooms.

There are few things in this world, the origin of which the research and ingenuity of man have not been able to trace; but, we must confess, that the origin of this attenuated style of building is one beyond our comprehension; and on which we are unable positively to enlighten our readers. We can only throw out, as a general suggestion, that it may possibly have arisen at a time, when the value of the land in city lots was beginning to be sensibly felt, and the size of the frontage assigned for dwellings, dimidiated, or halved, was so contracted that the owner was compelled to extend his building back, to obtain a sufficient amount of room, which, other-

wise, he could not have gained, except by additional and excessive height. There is yet another way, after the fact, of accounting for this peculiarity, namely, a presumption that, in the outset, the lots themselves having a narrower frontage and greater depth than is usual in our cities, when extensive accommodations became necessary, doubtless occasioned the introduction of this general plan. But what determined the primary contraction of the fronts? After all, the theory of secondary dimidiations glimpsed above, is probably correct.

In laying before our readers the design and plans, which form the subject of these remarks, we are only following out the programme we laid down for ourselves at the beginning of our work, viz., to present, from time to time, such conceptions as may exhibit what can be done in the way of erecting our dwelling-houses, under different, and perhaps unfavorable circumstances, as to locality; and to suit various modes of life, along with the infinite variety of opinions existing, as to what really constitutes a comfortable and convenient arrangement of the interior parts of a residence. We do not venture to expect, or hope, ever to produce a plan that would at once please and satisfy *all*; but simply strive to show what it is possible to do, leaving it to the judgment and individual taste of projectors, to adopt whichever pictured thought more particularly coincides with their views.

We will now proceed to give a description of one of the two contiguous dwellings, which—simply reversing the sides of the plans—will answer equally well for both.

By referring to the designs and plans it will be seen that each separate building is 25 feet in front by 42 feet deep, four stories high, exclusive of an attic story, presenting a French roof.

On the first floor, the hall, F, leading from the front entrance through a small

vestibule, is 6 feet 6 inches wide, for a depth of 30 feet back, and beyond, for a further depth of 12 feet, the width is increased to 8 feet, to obtain sufficient space for the main stairway, which continues up to the attic story. On the right, leading in from the main hall through a pair of folding-doors, is the



Second Story.

Ground Floor.

parlor, A, a fine, spacious room, 16 feet wide by 30 feet deep, having two windows in front, and communicating by means of sliding doors with an extension beyond, B, 12 feet by 14 feet, having a window on the rear, with a door communicating with the rear hall, G. This shows all the arrangement of the ground floor of the front, or main building. The remaining four stories have each two chambers, as marked in plan of second story, A A, with wardrobe-closets attached to each; F being the hall; containing the stairway, E.

We will now proceed with the back building: on the first story, proceeding through the hall, F, there is a side entrance, G, leading into the side yard. We then come to the private stairway leading to the upper portions of the dwelling. Beyond this is the dining-room, C, 22 feet by 16 feet. Adjoining the last is the pantry, H. Through the dining-room, we pass into the kitchen, D, 16 feet by 17 feet, supplied with a range, sink, &c.; and beyond—communicating with the kitchen—into the summer-kitchen, L, 14 feet by 16 feet, in which is the stairway to the cellar. The second floor has immediately above the side entrance hall G, mentioned before, a bath-room, lavatory, &c., marked G, communicating with the rear chamber, A. Beyond, at the end of the hall, F, is the landing of the private stairs, passing which, we enter a fine, capacious sitting-room, B, having two side windows, with an oriel window between them. This room, at the rear, communicates with a conservatory, C, by a window, or a glass door, opening into it.

The upper stories of the back building have each two chambers, with a bath-room and lavatory.

It may be remarked, that the floors of the back building are on a level with the half-landings of the main stairway. There is no way in which a dwelling planned with a variation in the height of stories between the front and back buildings can be made perfect, other than by making the rear floors coincide with this level.

We have now described this particular plan of Philadelphia dwellings; and, in conclusion, will only observe, that we are happy to see that a change is gradually, but surely, taking place in the tastes and views of our citizens, as to the mode of constructing our houses. In lieu of the long, narrow ranges of back buildings erected in such close and disagreeable proximity to one another as to be almost, if not quite within

shaking-hand distance—and totally excluding all modern ideas of comfort and domestic privacy—we see springing up in every quarter of our city what are called “three-quarter,” and, in many instances, “double houses,” utterly ignoring the old style, which we may venture to say is now fast getting out of favor.

We hail with delight this change, as both an indication and a natural result of the rapid and ever increasing advance in refinement belonging to the age wherein we live; and, as far as we, ourselves, are concerned, we shall assuredly improve every opportunity to extend a helping hand.

THE WEST SPRUCE STREET BAPTIST CHURCH

AT THE
NORTHWEST CORNER OF BROAD AND SPRUCE STREETS, PHILADELPHIA.

STYLE: VENETIAN-GOTHIC.

WE give a view and plan, in our present number, of this church, now building at the northwest corner of Broad and Spruce streets, in this city.

In this edifice the architect says, in effect, “he has not confined himself to the rules of any particular period, or the special development of the style in any region;” but the church has been designed “in the spirit of early Gothic,” with a tendency towards the Venetian, the latter evinced mainly in the use of different kinds and colors of stone in the exterior walls.

The walls are of stone, that used for the facing being serpentine, from Chester county, Pennsylvania, with Ohio “Clough” stone dressings.

The church will have a high-pitched open-timbered roof, slated, and finished with an ornamental iron cresting, as can be seen in our illustration.

The plan is cruciform, consisting of a nave and transepts, with aisles; and a tower and spire. The nave is parallel to Broad street, and the full length of the lot, 120 feet. The width of the church at the transept is 70 feet.

The principal entrance is through the tower, which stands on the Broad street side of the church; and, in connection with the transept gable, will make that the principal façade; although the fronts

on each street are to be equally well finished.

The plan is somewhat unusual, in having the Lecture-Room and Sunday-School in front of the Audience-Room, instead of behind it; and in substituting for the usual partition an ornamental screen of plate glass framed in carved tracery of black walnut, which can be opened and closed at pleasure; so that the Church, Lecture-Room, and School can be thrown into one grand auditorium, or be used separately.

The most striking feature of the interior, however, will be the Baptistry, at the head of the nave, behind the pulpit, built of polished marble, and enclosed with a lofty tabernacle of carved walnut, having gates of wrought metal-work, richly illuminated.

Behind the Baptistry, will rise a chancel window, 19 feet broad, and over 36 feet high, enriched with stone tracery; and filled with stained glass, to be imported from the celebrated Stained-glass Works, at Munich, Germany. The leading subject of the painted glass will be the Baptism of our Saviour, in the river Jordan, by St. John. The other windows will also be filled with stained-glass.

The organ will be placed in a gallery in one of the transepts.

The church has sittings on the main



WEST SPRUCE STREET BAPTIST CHURCH.

floor for over six hundred persons, and with the lecture-room, school and galleries, about double that number.

The tower measures 30 feet at the base, across the buttresses; will be finished with crocketed gables in its four faces; and have angle turrets, enriched with carvings. It will be surmounted by a spire banded with color, its upper portion enriched with crockets. The highest point will be somewhat over two hundred feet from the pavement. A turret staircase is carried up at one angle, and finished with an arcade having polished granite shaftlets surmounted by a stone coping. The belfry arches will be left open. Above the belfry is a clock-chamber.

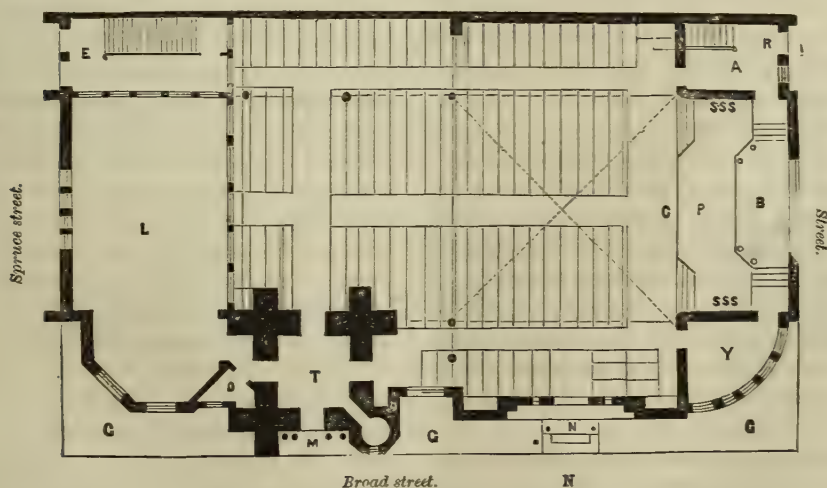
The lower entrance will be enriched with four shafts of polished granite, red and black, placed alternately.

Their capitals to be carved with the daffodils of spring, the bending grain of summer, the fruits of autumn, and the ice-laden branches of winter. Above their foliage, this text: "While the earth remaineth, seed-time and harvest, and cold and heat, and summer and winter, and day and night, shall not cease."

The exterior of various points is en-

riched with carvings, all different—but all appropriate. Those, for example, on the transept-gable, facing the East, though like the rest, in themselves different, are all identical in their symbolism. Beneath a cross which finishes the apex of this gable, is carved, enriched with foliage, the words, "Agnus Dei;" and following them, at intervals, similarly carved, the words, "Lux," "Dux," "Lex," "Rex," "Alpha," and "Omega;" and, below, the text, "Blessed are all they that trust in Him;" while around the great arch, spanning the porch and rose window above it, are seen carved the rose, the lily, the wheat, the vine, the lion, the crown, and the star, symbols which need no translation to those who know the blessings of a trust in Him, who is "The Lamb of God, the Light of the World," "Our Leader," "Our King," "The Alpha and the Omega," "The Rose of Sharon," and "The Lily of the Valley," "The Bread of Life," "The True Vine," "The Lion of the tribe of Judah," "The Crown of Glory," and "The bright and Morning Star."

Below the window, a band of foliage is carried across the archway, and bears the text, "He shall feed His flock like a shepherd." Below, it again, on each



M, Main entrance.
T, Tower.
C, Communion table.
P, Pulpit.

B, Baptistry.
S S S, Sedilia.
Y, Pastor's study.
A, Anteroom.

E, Entrance to school and lecture-room.
L, Lecture-room, (schools above.)

R, Rear entrance.
D, Closet.
N, Transept porch.
G G G, Grass and shrubbery.

side of the porch, are carved, on gablets bearing the symbols of the four Evangelists, the words, "We are his Witnesses;" while the porch itself, adorned with polished pillars of porphyry, whose capitals are carved with olives and palm-branches, shelters—under the overhanging arch of its door—a group in relief—a "Christus Consolator," and the enclosing text.

"Come unto me, all ye that labor and are heavy laden; and I will give you rest."

The architect is Mr. Edward Tuckerman Potter, 56 Wall street, New York. The stone work is under the charge of Messrs. Struthers & Son, 1022 Market street; and the carpenter work in the hands of Mr. Catanach, 1345 Lombard street, all of Philadelphia.

PRACTICAL CARPENTRY & JOINERY.

DETAILS OF DOUBLE DOORS.

THE accompanying PLATE OF DETAILS shows the finish for a pair of FRONT DOORS, intended for adjoining dwelling-houses, adapted for either a city, suburban, or other locality. Where they are erected so combined, they are meant for distinct entrance doors to each dwelling, although, in outward appearance, they present but a single feature.

We confine ourselves, in this plate, chiefly to a description of details for the stone work of these doors and their finish.

The steps, hand-rail with newel, the columns, architrave with pediment-head, and the side jambs within the doorway, will all be of stone.

It will be perceived from the plan that the jambs are of great depth, and have moulded panels, which extend around the arch-heads. By this arrangement, a deep recess is formed for the doors.

The platform is four feet in width, and extends to the inner line of the panel in the jamb. The sill of the door makes up the additional width from that line to the door itself.

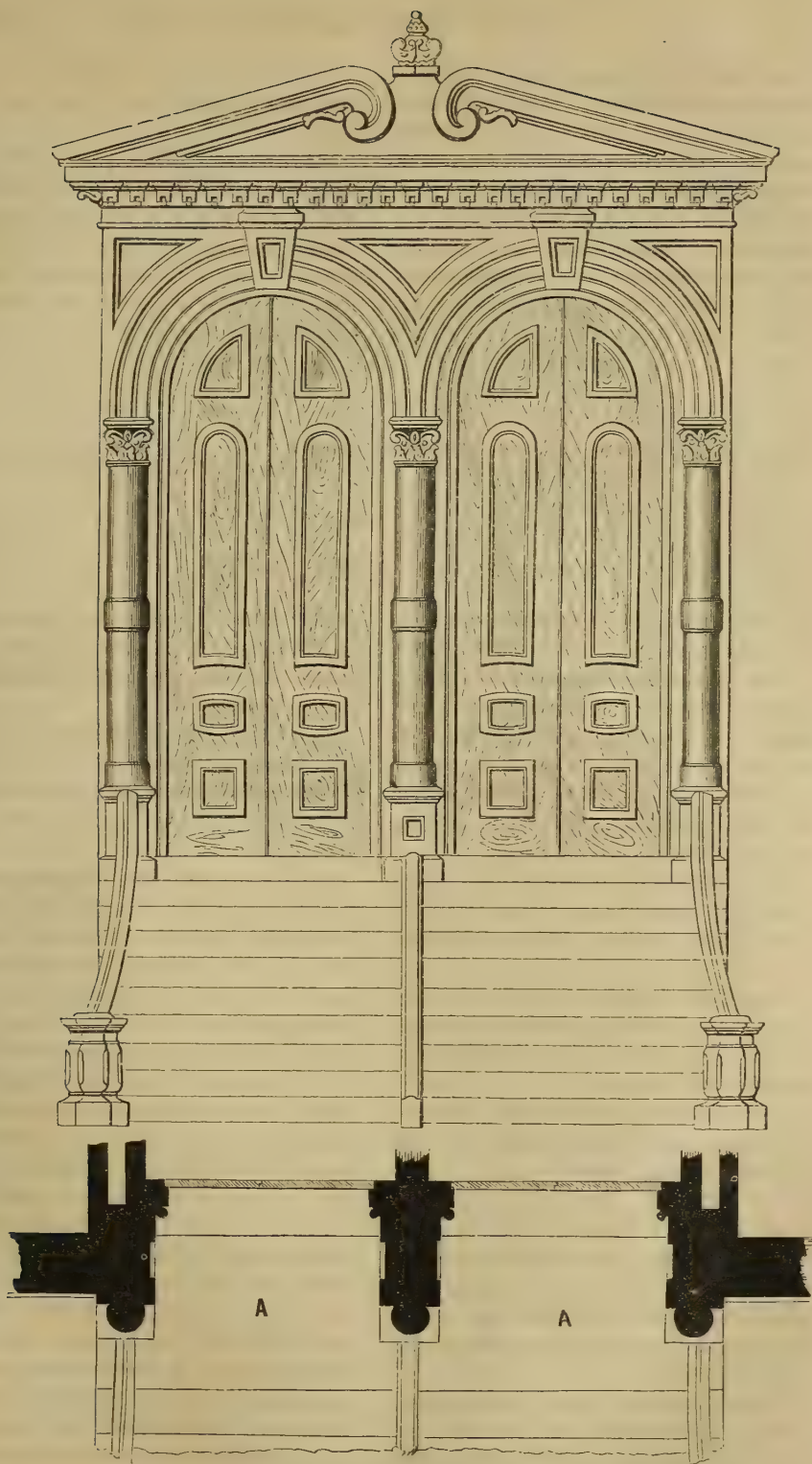
The columns are round, and of three-quarter size, resting on pedestals, with enriched caps and moulded bases. The shafts are plain, with a centre band. The architrave is moulded with keystone and

moulded spandrels. The cornice has modillions. A broken pediment surmounts the whole, with a dividing or centre ornament.

The hand-rail is moulded, and the balustrade perforated.

At the side of the plate is exhibited a section, showing the whole of these different details.

A door-piece of this design should be executed in white marble, as also the base and the water-table, and this we would more particularly recommend in case the walls of the edifice itself are faced with brick. There is no other description of stone that can be combined with brick to produce such an agreeable effect, or more strikingly break in on the monotony and sameness of these bright russet-colored fronts. Indeed, we may here remark, that we are strongly opposed to the use of any other description of stone, or of any other variety of shade for this purpose than white, in marble, on the ground of want of sufficient contrast. The object which we wish to attain is *not* harmony, but an agreeable contrast; and in no way is this more satisfactorily or pleasingly accomplished than by a happy blending of the two materials, dark red brick and white marble. This system of using



A PAIR OF FRONT DOORS.

different kinds of stone of diversified hues is much in vogue on the continent of Europe; but it is not one that we would advocate, or ever wish to see introduced into our country, as being utterly at variance with all rules of good taste. In Philadelphia, from the fortunate circumstance of the supply of bricks and marble being very abundant, the principle which we have been urging has been in practice for a long time; and the effect thereby obtained has been to relieve the monotony that would otherwise have wearied the eye in long, unbroken lines of red brick fronts. Not that there is still no room for improvement in this line—so much we cannot say; but still the standard of public taste is undoubtedly steadily and surely advancing, and we yet hope to see all such defects in our style of architecture, if not entirely remedied, at least much subdued.

The clay in the vicinity of Philadelphia is very superior in its quality and properties for the manufacture of bricks, and perhaps more abundant than that of any other of her sister cities, or we may even say of any city in the Union. Hence has arisen the almost universal use of that material in the construction of the walls of our numberless edifices of all descriptions.

Our marble quarries, too, are within a few miles of the city; and, in fact, some are within such close proximity, and so easy of access, that the material can be conveyed by wagons into the marble-yards. The stone produced from these quarries is probably equal, if not superior, to any marble in the country, and can be obtained of all shades and of any dimensions that may be required.

As we have before observed, we, in this city, are indebted for the very marked improvement in the external appearance of the majority of our dwellings to the fact of the supply of these two materials being so abundant and so

steady, as fully to meet all demands, not only for our own requirements, but for those of other cities. And in this connection—although perhaps not exactly apropos—we may be pardoned for remarking on the singularity of a circumstance, which has often occurred to us, as strikingly illustrative of the different characteristics in our individual States. We allude to our Eastern States, which border on the Atlantic ocean, abounding in and celebrated for their granite and brown stone. One would naturally suppose that, with such an inexhaustible mine of wealth, in the shape of building material, at their very doors, they would have employed it largely in the construction of their dwellings. On the contrary, however, the granite or brown stone, actually quarried, in digging their foundations, often in sufficient quantities for the whole structure, is carted away, and frame dwellings are put up. We can only account for this in one way, which is doubtless the true one, viz., that the close proximity of these States to the Atlantic ocean, with their consequent subjection to the influence of the sea air, renders the atmosphere so humid, that the use of such a *cold* material as stone for building would be utterly unbearable. In such cases, where stone is used, it being a conductor of heat, although not a good one, still better than timber, and colder than the surrounding air, it, in common parlance, *sweats*, or, in other words, condenses the moisture of the atmosphere in visible drops upon the stone walls. Timber and brick walls make a much more comfortable and healthy dwelling; and hence has arisen the custom, which is so prevalent in these States, of rejecting the material with which they have been so bountifully endowed by nature, and in its stead importing brick from Philadelphia, Baltimore, and other cities noted for the excellence of their manufacture, owing to the superiority of their underlying and surrounding clay.

FOUR DESIGNS FOR PORCHES.

THIS plate contains the sections of four porches, each of a different design, drawn to such a scale that their distinguishing features can be clearly and readily comprehended.

Porches are useful as well as ornamental appendages to a dwelling, and are more especially brought into requisition in suburban and rural localities. For city houses they are not generally well adapted, and hence not often to be met with. They are capable of being made as simple as may be desired, or, on the other hand, of receiving an infinite amount of embellishment; but this, of course, will, in every case, depend upon the taste and judgment of the owners; always bearing in mind that they should be designed strictly in keeping with the style of the building of which they are intended to become a portion. If this is not adhered to, an incongruity—displeasing to the eye, and detracting from the general effect of the structure, of whatever nature it may be—will be the natural sequence.

Porches are sometimes constructed two or more stories high, but, as a general rule, only one. This latter we should strongly recommend, owing to the difficulty encountered in making them of two stories, arising from the numerous joints of the timbers, &c., that must necessarily be made in the construction of the middle floors, which are at all times exposed to the weather, and hence liable to decay.

In the construction of porches, it is always best, whenever possible, to excavate or extend the cellar beneath them, in order to obtain a better circulation of air. This is the more especially necessary where it is designed to terrace up close to the floor. The cost of such excavation or extension of the cellar would be but a trifle beyond that of sinking the foundations, to be more than repaid by the additional advantage gained thereby.

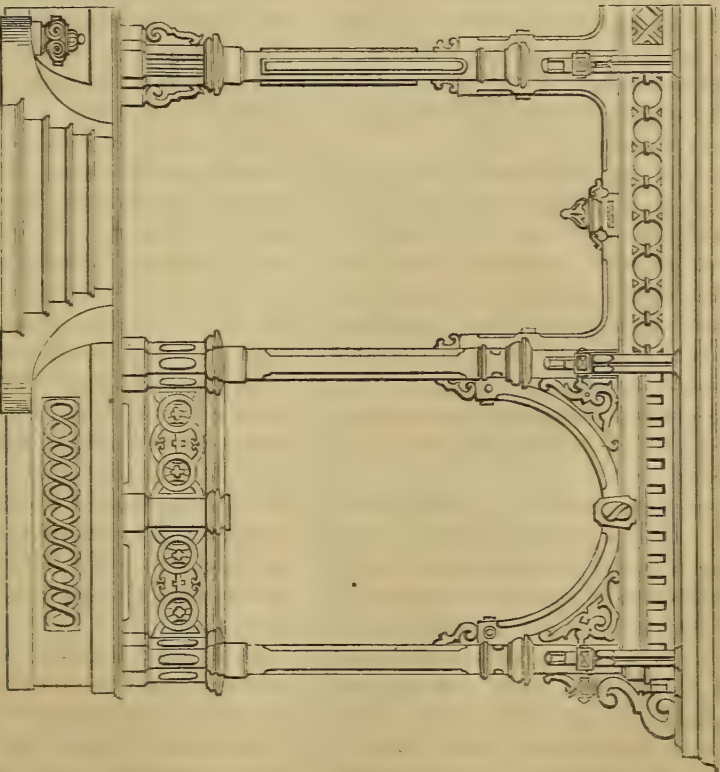
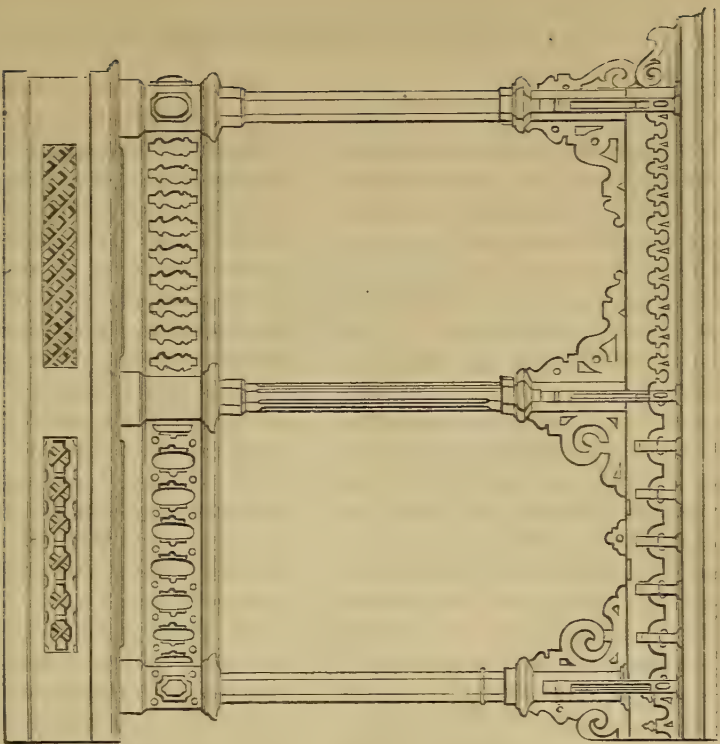
The floors of the porches in all cases should be laid with an outward descent of at least two inches to ten feet. The flooring boards should be of uniform width, say about four (4) inches, and one and an eighth ($1\frac{1}{8}$) inch thick, running outwards, or across the porch, laid with square joints, and not entirely close to one another, to allow the air to circulate through the joints, in order to dry the moisture that penetrates. We should recommend that these joints be painted before the boards are laid.

The ceilings, in all cases, should be lined with boards, of uniform width, and one inch thick, tongued and grooved, the joints beaded, and all dressed off to a smooth surface.

The ceiling joists should be three by four inches, square cross section, also smoothed off—the corners moulded or chamfered—and rest two feet apart, with the ceiling boards nailed on the upper side, thus forming panels, which, when of pine, should be painted, or stained to represent hard wood, and all finished in oil, without varnish.

The roofs of porches should always be covered with durable materials. Being for the most part flat, we would recommend tin in preference to any composition. Slate or shingles would hardly ever be available, owing to the pitch of the roof. Gutters should be formed along the eaves, and the water conveyed to the ground through conductors. These latter, sometimes placed inside the posts to conceal them from view, should always be made square, or corrugated, to admit of the expansion by frost, which causes the seams of round conductors to crack and open, but which has no effect whatever on the kind we have here recommended.

Balustrades are often introduced on porches, and are absolutely indispensable where there is an elevation to the porch of upwards of two or three risers. In all such cases the lower part should be left open, to admit of a free circulation of air. Where there is a cellar



FOUR DESIGNS FOR PORCHES.

beneath the porch, the cellar sash will be placed behind the guards; but in cases where there is none, the sash will be omitted, and the porch finished with the guards alone.

The posts forming the supports of the porch are generally constructed of two-inch plank, well jointed together, with the joints first well coated with white lead, to check the moisture from penetrating. This coating should be given in *all* cases where joints are exposed to the action of the weather; and all wood-work similarly exposed should have at least four coats of paint on the surface.

Porches of the description we have exhibited can now be constructed at a comparatively trifling cost, owing to the advantages of the late improved machinery for planing, and sawing scroll-work, more particularly where such is available on or near the spot. Indeed, there is no reason why—with the facilities which now exist in transportation, by rail or other conveyance, between every part of our country, however distant or retired—such a simple and easy mode of embellishing, and, at the same time, increasing the comfort of our dwellings, should not be introduced throughout the length and breadth of the land.

A PAIR OF FRONT DOORS FOR A DOUBLE DWELLING.

THIS plate shows the details, on an enlarged scale, of a pair of front doors for a double dwelling.

A shows the foundation for the steps.

B shows the cellar wall.

C shows the panel of the door jamb.

D is a section through the pediment over the doors.

E shows the wall above.

F is an enlarged drawing, showing the stone hand-rail and perforated balustrade.

G is enlarged plan and elevation of newel.

H is enlarged drawing of the cap of the columns.

I is section of architrave over front door.

J is enlarged drawing of cornice.

K is enlarged drawing of dividing or centre ornament of pediment.

L is section of front-door panel.

CONSTRUCTION OF A FRENCH ROOF.

WE here propose describing the method of constructing a “MAN-SARD,” or what is usually termed, a FRENCH ROOF.

The introduction of this kind of roof into our domestic style of architecture is of so very recent a date, that very many of our mechanics have not, as yet, become familiar with the practical mode of constructing it. We have, therefore, thought that a detailed account of the simplest form—and that which is in general use—might prove acceptable to many of our readers.

There are quite a number of different ways in which this particular style of roof is formed, increasing in complication proportionally to the massiveness and costliness of the buildings for which they are designed; but these we do not intend taking up in the present number. We shall reserve them for a future occasion; and confine ourselves to that only, which, being the most simple, can be readily comprehended by every one.

This plate represents a design for a concave curved roof, intended for an ordinary dwelling-house, or building. It is shown in section, exhibiting all the timbers in their places; one half presenting the interior, and the other half the exterior, looking at the naked timbers, including the joists of the attic floor, and the connection of the roof timbers therewith. It also includes a section through the cornice, showing the profile of the supporting brackets, and the face of one. We will now proceed to describe the various timbers, their purposes, and the mode of connecting them, which will appear in regular order, as follows:

A is the exterior wall of the building,

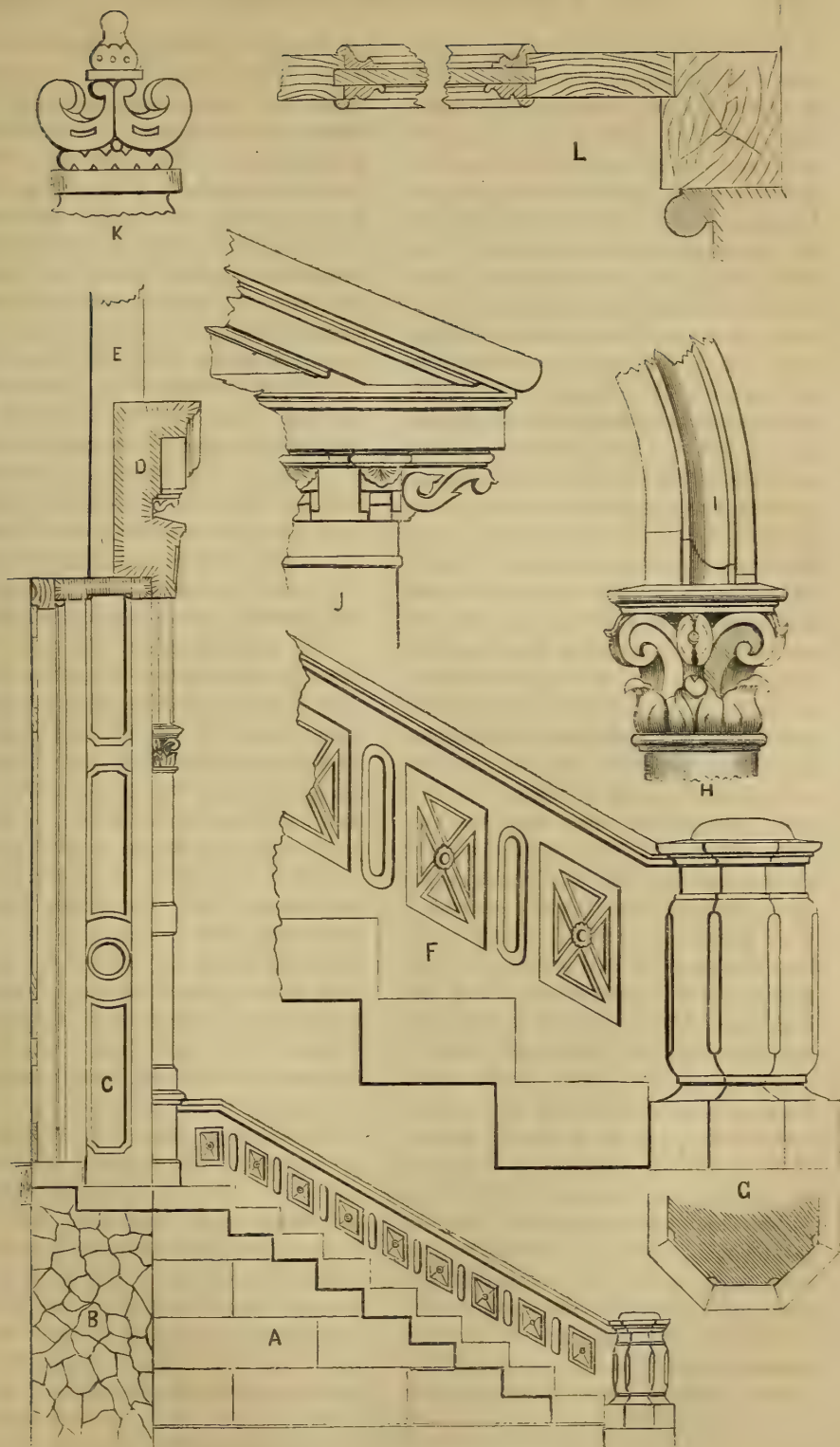
which is indicated on both sides; but only lettered, for reference, on one. B, the flooring-joists, resting on the walls, the bearing of which is on a line with the lower end of the brackets, and two feet below the plancier* of the cornice. In instances where the house is exposed on either side, or on both sides, "look-out" joists will be necessary, which must be framed into the regular joists, back, about one foot distant from the wall, and should not be more than two feet apart. The trimmer-joists should be either five inches thick, or be formed by two ordinary ones pinned together, in order to obtain additional strength to make up for that which is lost by the mortices for the lookout joists. C is the lookout-piece and skeleton bracket, to receive the cornice: it should be one and a-half inches thick, and securely nailed to the main rafter E, and upright stud D. F is the furring-piece, nailed on the side of the rafters and lookouts: this is also one and a-half inches thick, and forms the curve line of the roof, with a small gutter constructed at this point, to check the drip from the cornice. E is the main rafter on the sloping sides of the roof, three inches by eight, and two feet apart, secured to a sill at the foot, which is firmly spiked into the joists B, and is even with the face of the wall, on the exterior of the building. D is the upright stud, that acts as a spur or brace, and forms a plumb-line in the interior of the room. This also extends to the floor, and is secured to a sill, in a similar manner with the rafter just described; but these upright studs are generally placed close to the *inner* face of the wall. By this arrangement there is comparatively little space lost in the rooms of this story. The size of these upright studs is three by four inches; and they are checked into the rafters at the ceiling-line, as indicated by the connection with

the rafters beneath the collar-beam. G is the collar-beam, two and a-half inches by eight, dovetailed into the rafters, and well nailed. H is a brace from the centre to the head of the rafter. I is the top-rafter. J is a truss-piece, in the centre, of double thickness. Each is one and a-half inches thick, and dovetailed into both sides of the head of the rafters, I; and also into the collar-beams, G; and well secured to each of them. K is the top-plate framed into the head of the rafters. L is the boarding that forms the frieze beneath the cornice, as it appears without the wall; but this is mostly carried up as high as the lookout joists; is usually termed beam-filling, and should never be omitted, as on it depends entirely the stability and strength of the footings of the rafters. It also acts as a support to the lookout joists. M shows the rafters, looking towards them from the inside; and N, the same as they will appear from the outside, with the furring-pieces for the curved line of the roof nailed on the sides; and the lookouts also are shown, as they are nailed on. O is the profile and face of the bracket of the cornice. P is the upper furring-piece and cornice, with the gutter for the water from that portion of the roof. The conductors to convey the water from these gutters should be carried down between the timbers of the roof, in order to conceal them; and should be connected with the lower conductor, beneath the main cornice.

The upper portion of the roof, which has usually a slight pitch, should be first covered with what are termed sheathing-boards, and then with tin. The sheathing-boards must be well seasoned, not less than one inch thick, narrow, securely nailed to the rafters, and invariably tongued and grooved, so that, when laid, they will present an even surface for the metal covering.

The sides of the roof that form the curve are boarded in a similar manner, except that the sheathing is laid with

*Indifferently spelled by the authorities *plancere*, *planecer*, and *plancher*. We give what we deem the preferable mode.



DETAILS OF DOUBLE DOORS.

square joints. This portion of the roof is invariably covered with slate, whenever such material can be obtained; and where it is not procurable, shingles are often substituted. When the form of the roof is curved, the slates are usually of a smaller size than those for an ordinary straight roof. The first course of slate is laid immediately along the upper edge of the gutter; and below this, commencing at the eave, including the gutter, is covered with tin, which extends up the roof, about four inches beneath the slates.

The upper roof is often raised to a sufficient height to admit of slates or shingles being used. In such case, the pitch should never be less than 21 degrees; and more should be given where the design will permit.

In all instances, when roofs of this kind are constructed, it is necessary to line inside with rough boards, which must be cross-cleated with furring laths, at least one inch, or one and a-quarter inches thick. These furring laths should not be less than sixteen inches between centres, to admit four nails to the plastering laths which are usually cut four feet long. These spaces for nailing are very important, both as a convenience to the plasterer, and also an economy in the material. This mode of finish not only strengthens the frame-work of the roof—which is a very essential matter, particularly when the building is exposed on all sides—but in summer it also prevents the heat from penetrating; and renders these apartments quite as cool and as pleasant as though the walls were constructed of stone or brick.

There is another style of finish, less expensive, it is true, and, perhaps, comparing favorably with the one last mentioned, as to its effect on the temperature of the rooms, but still not possessing the same amount of firmness and stability. This is to lath and plaster one coat directly on the studding; and after it is partially set, to nail the furring laths upon this, in the manner we

have just described for the boarding. This mode, not so good for the framework, is decidedly the best adapted simply for ceilings, in which it creates firmness, prevents the cracking in the plaster, which is occasioned by the irregular shrinkage of the joists; and also deadens sound between the stories.

There should always be reserved a good-sized space for a loft, above the rooms that are constructed within a roof of this description.

When the building is of greater width than can be spanned by single joists, they should be secured together. One very simple plan of doing this is, to nail a cleat along the side, five or six feet long. This, in any ordinary building will answer the purpose of preventing the spreading, by any lateral pressure there might be from the roof, aided by the influence of the wind. There are numerous other methods of binding joists; but we shall treat of them in a future number, when we introduce structures of a more ponderous and extensive character. The one we have given is the simplest in common use.

The profile and face of the bracket beneath the cornice, as indicated, is constructed with three separate pieces in thickness; the core or centre-piece is three inches, or as thick as a three-inch plank will produce. The sides are each one and a-half inches, pierced through to the required form; and nailed securely to the sides of the centre-piece. The face is frequently advanced half an inch beyond that of the centre-piece, to form a sinking, and to blind or conceal the joints.

We propose, in the next description of a roof of this kind, to show, in detail, the construction of the dormer windows and balustrades, and their connection with the roof. In order to have them more easily comprehended, and be of more practical benefit to mechanics, we shall present detail drawings, on a large scale and in regular order, of every part, from the simplest up to the most complicated and elaborate.

THE GAZETTE.

HANGING SHEAVES FOR SLIDING DOORS.

OUR friend, Mr. J. B. SHANNON,* has very kindly furnished us with a handsome cut of two different sizes and as many styles of HANGING SHEAVES, described as follows :

No. 1 shows a six-inch sheave, with hand-rail nut, suitable for a door three feet or over in width, and one and three-quarter inches or more in thickness.

No. 2 gives a four-inch sheave, of the same style as No. 1, and intended for lighter doors than that just mentioned, in which, consequently, a lighter sheave than the six-inch may be used.

No. 3 displays a six-inch sheave, with a flat frame, to be used where individuals object to boring the doors to admit the hand-rail pattern ; and, also, where appearance is not a matter of great import.

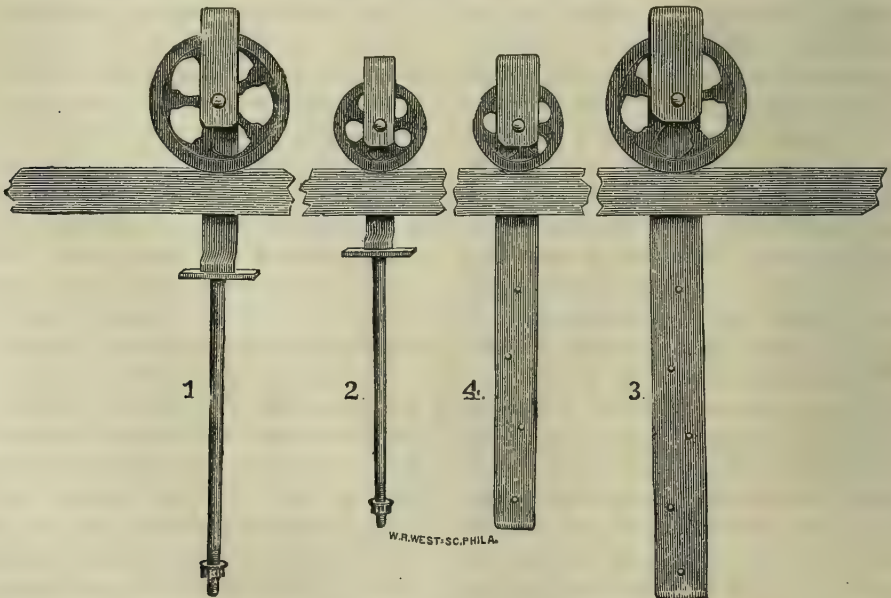
Where this form is used, the bar is let into the door flush, or level with the surface, and painted over.

No. 4 exhibits a four-inch sheave, of the same fashion as No. 3.

The frames are all made entirely of wrought-iron.

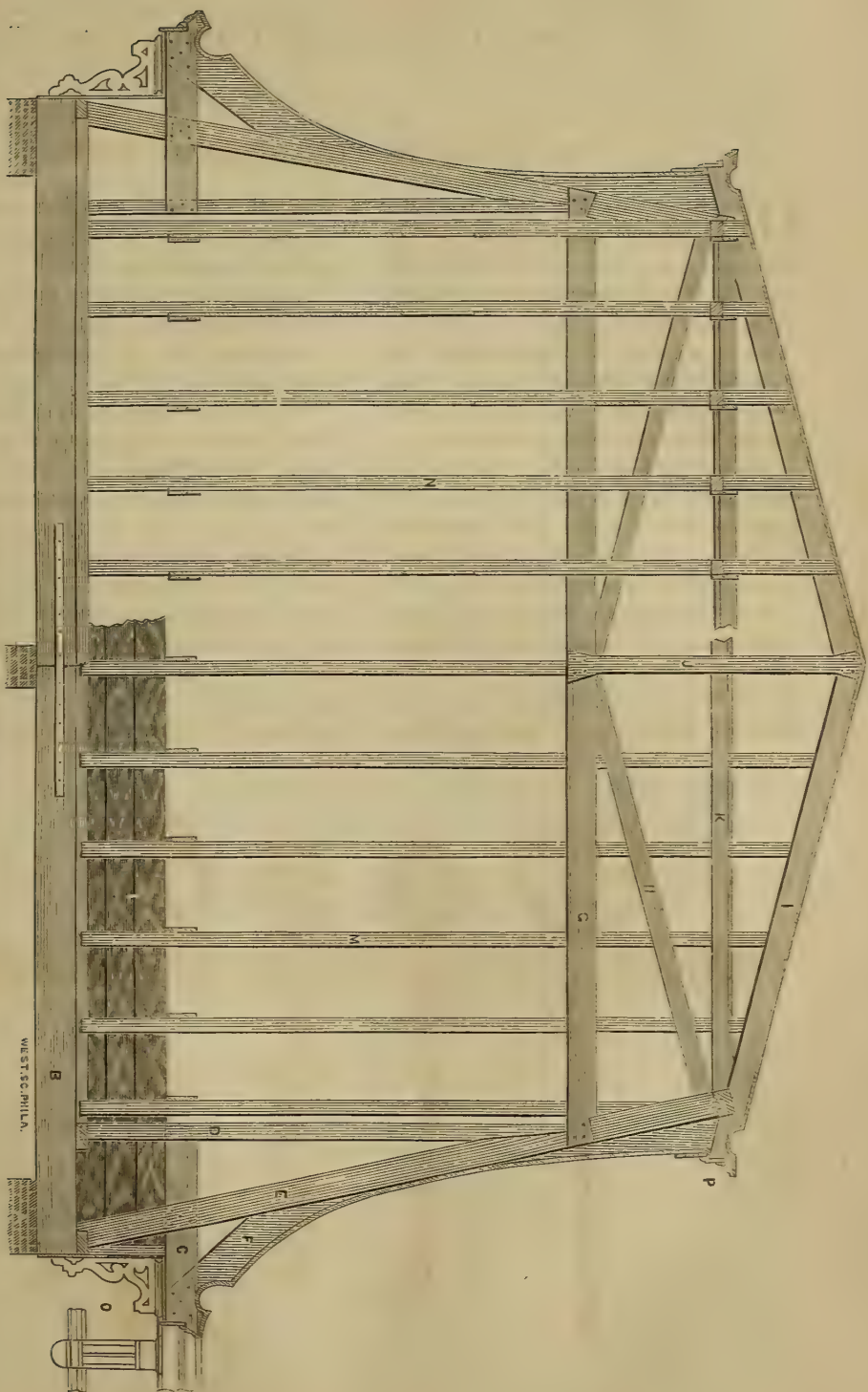
The rail is a wrought-iron bar, two inches wide and one-quarter of an inch thick, dressed semi-cylindrically, or round on the upper edge, to fit the sheave, and drilled for screws, to fasten it on a horizontal piece of timber, which is attached to the studding.

The sheaves may be made of "COMPOSITION," better known as "PRINCE'S METAL," and run on a steel pin ; or, in a less expensive style, such as is generally used, the sheaves are constructed



* Manufacturer and Dealer in Hardware, No. 1009 Market street, Philadelphia.

CONSTRUCTION OF A FRENCH ROOF.



of iron, drilled, turned to a true surface, and run on a "composition" pin.

It is hardly necessary to observe, that all the sheaves to any particular door, or pair of door-leaves, must be uniform in diameter; and also, that the larger sheaves move with the application of less force than the smaller ones.

This style of sliding door was first introduced, some twenty years since, by Mr. W. T. FORSYTHE, at that time an energetic builder, full of new plans and partial to modern improvements, and put up in the then held splendid residence of Mr. Christopher Fallon, on the south side of Walnut street, east of Sixth. The owner desired that something might be done to avoid the annoyance of hinged doors swinging back and striking the furniture. The floor-rail for sliding doors, as then used, being considered a stumbling-block, as liable to catch the foot in passing from one parlor to the other, and having likewise the disadvantage of causing a break in the carpet between the parlors, Mr. Forsythe said, "I will make them slide at the top," and he did so.

The building referred to has since gone the way of many residences considered splendid at that time. It is now occupied by lawyers, architects, and conveyancers.

The plan upon which the first were put up may be found in "Sloan's Constructive Architecture," page 64.

A glance at the two plans will show that the same result is obtained by the later and present one cheaper and very much more simply.

Since the introduction into general use of sheaves for sliding parlor doors, and rails to hang them from the top, instead of running them on the floor, architects and builders have given them such general approval, that any attempt at recommendation would be superfluous. Our only object is to present to our readers the most generally used and approved styles, and to say that a parlor door, trimmed in this manner, will not cost much more than when made to swing with good "butts" and "bolts," whilst the convenience and comfort of having the doors slide back into the partition—out of the way, with no rail on the floor, instead of swinging and occupying room which can so much better be filled with furniture—render the HANGING SLIDING DOOR so desirable, that in building a first-rate house, or even a tolerably good one, any difference in price that may be found between the two plans is overlooked in the prevalent desire for comfort, convenience, and style.

NEW MARKET IN NEW YORK.

It is a most unaccountable fact, that no place in the United States can present so great a display of actual nastiness and discomfort in the matter of market buildings, as the grand metropolitan city. That which is called "Washington" is a stigma on the name; and, being the largest, is therefore the greater stigma. The "Fulton" is another insult to a great name—being as dirty in proportion as that just alluded to; and as inconvenient, as if designed so to be.

It is therefore with an unfeigned sense of relief, that we turn our attention to the Market now being built in the Eighteenth Ward, between Sixteenth and Seventeenth streets, next to the East river, at avenue C.

This structure covers an area of 347 feet by 164 feet, fronting on the avenue and having entrances on all four of its sides. It is built of Colabar brick with black mortar; and owing to its extent and to the great number of openings for circular-headed windows and doors,

presents a good appearance externally; especially the principal front, which is two stories high, with an angular pedimented centre, on either side of which are semi-circular pediments of lesser proportion. Two similar pediments are on the sides, equidistant from the corner. This centre is pierced with a large double or coupled window, beneath an arched recess, over which is set a marble slab, and in the pediment, above it, another. On the upper one is the year of erection; and on the lower and larger the names of the three Commissioners, appointed by the State to superintend the erection of the Market, and, also, the name of the Architect. This centre, of two stories, is covered with a semi-circular roof, from which rises a cupola, with a dome, furnished with a gilded weather-vane and the cardinal letters. This second story will be occupied by the officers of the Market:—a circular staircase of iron leads to it.

The whole structure is covered with a roof divided, in its width, into three sections of segment-trussed girders of heavy timber, substantially framed together and securely bolted, having iron tension-rods for ties, and these latter sustained by rods passing through and firmly bolted to the arched girders. These girders are placed 16 feet from each other, and are upheld by the two side walls, and two ranges of iron

columns, throughout the length of the building, 347 feet. On each of these three great lines of roof rises a ventilator, 8 feet high and 15 feet wide, through whose continuous range of windows a plentiful supply of light aids the windows in the walls; and, as the sashes are made movable, and under the simplest control from below, these give good ventilation to the building, and hence their name.

The entire roof is covered with tin of a superior quality; and the valley-gutters convey the rain water to the columns, which conduct it to the system of drain-pipes laid beneath the floor, which, again, discharge it in the river.

The internal arrangement of this market is roomy, convenient and accessible, having nine avenues, with 140 stalls, occupying about three-fifths of the area, for the retail trade. The other two-fifths belong to the wholesale department; and through this are two drives, 12 feet wide, at right angles with each other.

Viewed from either end, the interior presents a very light, pleasing appearance; and the visitor is naturally led to hope, that this is but the initial building of a fit and proper system of market accommodation, which New Yorkers are justly entitled to, if it were only for their most exemplary patience in the past.

DOMESTIC ARCHITECTURE.

HEREIN New York may well raise her head in proud pre-eminence; for—although other cities in the new and the old world may surpass her, in single instances—where can be found so general a display of elegance, as meets the eye of the observer, in the numerous palatial streets of this princely metropolis? Nor is this array of grand habitations confined to our day. No—

the march has been a progressive one from the days of our Dutch predecessors down to the present; and has now more and more the unabating progress of ambition in it than ever,—bidding fair to overshadow, in the future, the efforts of the present, as the present has bedimmed the once-admired structures of the past.

Taking advantage of every novelty,

which fancy introduces into the architecture of the day, and which fashion stamps with her signet, our merchant princes, ever desirous of surpassing their neighbors, grasp with avidity, and without delay make use of, the newest designs,—pulling down and building up, with the same matter-of-fact indifference, as though changing a spring garment for a summer one. Thus, we see the Mansard roof taking the place of the Roman, Grecian, Italian and Gothic coverings. Nothing else presumes, just now, to compete with this happy notion of Monsieur Mansart. It is, certainly, a vast addition to our field of domestic design; and deserves well the widespread patronage it is receiving. For, with its aid, we may run our buildings much higher than of old, without the least dread of appearing overgrown, or awkward. It is indeed a very pleasing treatment of a once very troublesome feature of construction. But even it may prove a negative blessing, as we have too often seen the angle of inclination such, as to give it almost the appearance of a one-fourth pitch hip-roof, with the top cut square off. In fact, the angle of the Mansard is almost arbitrary, and ranges within 65 and 70 degrees. Some architects have made it greater than this; and certainly without improving its beauty.

One of the great objects gained, by the use of this form of roof, is the head-room obtained in our garrets.

The loftiest Mansard in New York is that of the Herald Building, which is unquestionably a very fine specimen of that style of roofing; and in light, space, and ventilation, answers well the necessities of a composing-room.

Among the many private dwellings of the first-class, which have expensive roofs of this formation, that of A. T. Stewart, the merchant prince, stands prominently forward; and is, in the pleasing tints of its slating, a relief to the eye, from the mass of white marble it surmounts.

But, as we propose at another time, a review, critical and descriptive, of these first-class houses, we merely mention those alluded to, in speaking of the Mansard roof. We will, here, venture to name, also, the Academy of Design, as being a fair specimen of unique buildings crowned with this ornamental covering. If the folly of fashion, led by the whims of wealth, does not control the better judgment of our architects, the Mansard may have a most desirable reign. If otherwise, it may prove a curse to art, instead of a blessing.

The interiors of our dwellings of the higher order are, for the most part, admirably arranged as regards comfort combined with elegance; and, in fact, no novel idea of the architect, the cabinet-maker, or the upholsterer, fails to find ready and liberal patrons, in the wealthy class of our citizens. The long-established vocation of the grainer and imitator of valuable woods is now pushed aside, to give place to the real articles; and walnut, butternut, beech, maple, rosewood, &c., are to be found in the doors and wainscotings of every house of any pretensions to high taste. Nay—this innovation has even reached a wider field, for a company in Boston* is now actively engaged in manufacturing a beautiful substance for wall-papering, in the surface cutting or veneering of the most admired woods, ready to be glued or pasted on the walls, in any form or shape required. The branch office, on Broadway, is well worthy of a visit; and shows how ornamental this novel production appears, laid on in long panels bordered with gilded strips of moulding, each panel a different wood, and all highly varnished; being capable of receiving a thorough washing; thus

* According to our very reliable information the American Veneer Company is located in New York city itself, and entirely different companies, dependent on them for the Veneer stock, are engaged in introducing these wall hangings. We have one such in Philadelphia, established about a year since, and the Bostonians are probably similarly well provided. Why should New York be content with a branch office?—Eds.

remaining bright and untarnished, as long as the wall it so beautifully clothes shall remain; and not being liable to split, or crack, as is too much the case with wainscoting.

If any inventive genius will now introduce a ready method of porcelaining, or so coating ceilings, that they, too, may be washed and kept bright, he will deserve the patronage which such a boon to domestic construction is certain to draw forth.

Sliding doors are a great improvement on the venerable folding principle. And these have received great aid from the excellent invention of Newman's Patent, by which the old, and too often cranky, rollers and tramways on the floor have been quite superseded; and now an infant can move the doors, which under the *ancien regime*, often resisted the strength of an athlete, and the patience of a Job.

There are a thousand aids to elegance, in fact, which have been introduced into our modern houses, more or less remarkable. But the systems of HEATING and VENTILATION are, by universal acknowledgment, the most prominent of all. For, lacking either, or both, of these, what becomes of our positive comfort, even though possessing all others?

Of such absolute necessity, to a full and true enjoyment of health and happiness—for comfort is happiness—are both these great principles, that it becomes imperative that we shall enjoy them; and, knowing such to be the fact, men of an inventive mind bring their genius to the determined study of the subject,—if not for the sake of philanthropy, certes for the acquirement of that wealth, which is the prize of him, who distances all competitors.

Philosophers have given deep attention to the subjects of heating and ventilation; and their thoughts, surmises and propositions, are to be found, in pamphleted importance, upon the tables of all our architects. And how many, how various and how unfounded in some

instances, are these speculations and theories? On a coming occasion, we will look into their respective merits, giving to all and to each a clear stage, and no favor; and where we consider it desirable, will present illustrative cuts of their peculiarities.

It is a subject of vast importance to the great human family, this ventilation. It is the natural food of the lungs, and should be unexceptionable. Nature intends that it be so. Art has no higher aim, than to make it so. It therefore becomes the peculiar study of the architect, to which in his compositions, he should sacrifice much that he retains for the mere sake of effect. A well-ventilated building, he should remember, is intrinsically beautiful, not as a thing to be looked upon with satisfaction by the critical eye of the limited circle of taste merely, but to be enjoyed as a blessing by all. Let the architect's ever-present precept be: THE GREATEST AMOUNT OF GOOD TO THE GREATEST NUMBER.

HEATING is, or ought to be, the great adjunct to VENTILATION. For HEAT certainly exercises a very great influence on the atmosphere, which rises, or falls, just in proportion to the amount of that element. The architect then, who would become master of the subject of ventilation, should apply his mind to this kindred topic, that the two may be made, as nature meant, to assist each other.

There are still more aspirants to fame in this latter science than in the former. For the great mass of inventors and designers—who present the community with their ideas of what stoves, furnaces and heating apparatus of every sort, should be—seem to have had but one idea—that of producing heat, and nothing more. Yet so blind are they, that even with the broad hint given them, in the fact that *draught* is necessary to combustion, they fail to make provision for ventilation; and are only desirous of producing the one effect, wholly regardless of the other. Now, what would be

thought of the man, who, in this enlightened day, would study to generate steam, without providing a safety-valve? Yet the latter does not place human life in more danger than the former.

It is a well-known fact that the objection to the *fire-place* is really the most commendable thing about it; that is, that it draws the cold air towards it, and sends the hot air up the chimney: so that, to keep warm, in front, one must receive the cold air, on the back, and *vice versa*. The fire-place, then, is a more sanitary institution, than it is credited to be, no matter how much more unpleasant than the stove.

An eminent physician of a former day, on entering the close room of a patient, used to apply his cane to the wholesome

task of ventilating, by breaking a pane or two of glass in the windows.

Might not our profession follow so sensible an example; and make ventilating holes of some sort in the rooms designed for human beings to breathe in?

So, also, might our profession take care, that the heating process, adopted by them, be such, as to give a salutary heat; not by roasting air; but by giving to the natural atmosphere, as introduced fresh from without, a warming influence so gentle as to be genial—at the same time, that it is wholly innoxious to the lungs.

Such a desirable principle of heating may, at no distant time, be fully realized. Meantime let us not discourage the inventors.

THE BATTERY.

NEW YORK.

FEW cities are gifted with such a superb breathing-place as the Battery, and no city, save New York, would freely relinquish its possession to an institution, which at once renders it unfit as a pleasure ground for citizens to enjoy the ever-charming, ever-new scenes of moving water, bedecked with sleeping or dancing craft, of every form and size, that delight the eye of the visitor to that spot, once so much sought by our fashionable people. But the Emigration Commissioners got hold of Castle Garden; and then the Battery at once lost its charm; and declined steadily, until the war gave rise to the Barracks, when fully one-fourth of the public ground was taken from the people to be used for these, and shortly afterwards for a Cholera Hospital. Alas! what a falling away of pride and prettiness!

But there is yet a hope that the Battery may some day be redeemed. The Barracks and Hospitals, being no longer required, have been taken down; and the

sea-wall is being extended, so as to increase the area, by encroaching on Neptune's domain, forming a segment of a circle, faced with well-built masonry, on which are erected granite piers to have, at some future day, mayhap, either chains or bars, to fence in the pedestrians.

Why not remove the unsightly emigrant sheds, and turn Castle Garden into a public Bath? Why not remove the Augean stable of emigration to Hart's Island, which is, report says, about to be relieved of its fearful powder-magazine?

There is a chance for New York to make this Battery a beautiful feature, whether viewed from the harbor, or enjoyed, as it once was, on its broad clear walks and trim green swards. It is the central object of Manhattan Island; and it should be made worthy of its position. It has claims, as well as Central Park, and a moiety of the money, so freely expended on the latter, would make the Battery one of the most charming spots any city could boast of,—conducting

alike to the health, comfort, and happiness of our citizens.

But, as we said, the people authorized to look after such matters are actually doing something towards ameliorating the degraded condition of the Battery. Who can say, what some good genius may do for it yet, or how near our de-

sires for its regeneration may be to fruition?

[Our contributor is right. New York has a splendid opportunity in the Battery, which should be renovated and enlarged; and, in addition, be furnished with a stately monument to Hendrick Hudson.—Eds.]

REVIEW OF NEW BOOKS.

THE WORKSHOP. A MONTHLY JOURNAL, DEVOTED TO THE PROGRESS OF THE USEFUL ARTS. Edited by Prof. W. Baumer, J. Schnorr and others. 4to., 18 pp. per monthly part, with artistic and elegantly engraved illustrations on wood. New York: E. Seiger.

This is a work of great usefulness, executed literarily in a very satisfactory manner, and typographically very tastefully presented. By no means, as many might suppose from its title, intended entirely for Designers or Artizans, it will be found by general readers, a very efficient aid toward the attainment of that knowledge, qualifying them for the proper appreciation of most productions of taste. Enlarged with this number.

ON THE CONSTRUCTION OF IRON ROOFS. A THEORETICAL AND PRACTICAL TREATISE BY FRANCIS CAMPIN, C. E., &c., &c. With wood cuts, and plates of roofs recently executed. 1 vol. 8vo., pp. 33. Printed by the Photographic Process. New York: D Van Nostrand, 1868.

A very useful book for young architects, and for builders and mechanics in the branch of which it treats. Its very purpose required compendious succinctness, and there is certainly no waste of matter. It is divided in three parts, Introductory, Theoretical and Practical; and appears to contain all needful formulas and demonstrations.

CHILDREN WITH THE POETS. BY HARRIET B MCKEEVER. 1 vol. 12mo., pp. 360. Phila.: Claxton, Remsen & Haffelfinger, 1868.

Those educating children, often feel the want of a good and suitable volume of poetry, in order to select thence subjects, whose rhythm and rhyme may help fasten certain truths upon the memory. To aid this want has been the aim of the compiler of this volume. Her work has been well and conscientiously done. The book contains no mere frivolity, but much to amuse and instruct.

CALLAMURA. BY JULIA PLASANTS. 12mo., pp. 464. Phila.: Claxton, Remsen & Haffelfinger.

Callamura is the name of a Southern country seat, to which "only the most aristocratic families were welcome," whose inmates and frequenters discourse a *la hant ton*; in which a wedding occurs early, and over which broods desolation to close.

This is a well-written society novel of that class which, having direct reference to the effects of the late civil war, certainly cannot much benefit the country at present. As Americans, we need neither sentiment nor ratiocination on this subject, which is too raw and recent; but honest application and persistent industry in the ordinary pursuits of life. All through the conflict histories were compiling, novels and dramas writing, and poems rose and fell throughout the land. The convulsion was entirely abnormal in many things, but in none more than this strange contemporary occupation of the inkstand and the printing press. Diaries, annals, etc., we want, it is true; but it is needless to say, that all this kind of work, executed in passion, or in prejudice,

is to do over. These remarks have no special reference to "Callamura," which will doubtless find plenty of readers inclined towards the "lost cause."

THE BACHELOR OF SALAMANCA, TRANSLATED FROM THE FRENCH OF M. LE SAGE. 2 vols. 18mo. Phila.: Thos. W. Hartley, 819 and 821 Market street.

It is almost superfluous to say a word of commendation concerning Le Sage. The author of *Gil Blas* and *Le Diable Boiteux* was so keen an observer of human nature, so agreeable a narrator of what he saw, so good an inventor, and so brimming with geniality, that he claimed, and commanded at once, a large public, whose numbers have continually increased from his day to the present. The work in question, though not by any means his master-piece, is extremely readable, and well adapted to while away a leisure hour.

TALES OF ALGERIA, OR LIFE AMONG THE ARABS, FROM THE "VELOCE" OF ALEXANDRE DUMAS. BY RICHARD MEADE BACHE. 1 vol. 12mo. Four spirited illustrations on wood. Phila.: Claxton, Remsen & Haffelfinger.

The "Veloce" is the French frigate feigned to be placed at the disposal of the narrator of quite a number of short descriptions, tales and incidents, having no special connection, but agreeably set forth in the course of the voyage, and terminated by a contrast between "The Arab and the Frenchman." The work appears to be well translated, and is well suited for a desultory hour.

ELEMENTS OF ART CRITICISM, COMPRISING A TREATISE ON THE PRINCIPLES OF MAN'S NATURE, AS ADDRESSED BY ART. Designed as a text-book for schools and colleges, and as a hand-book for amateurs and artists, by G. W. SAMSON, D. D. 1 vol. 12mo., pp. 406. Phila.: J. B. Lippincott & Co., 1868. With illustrations.

For popularizing art-knowledge, no better means could be devised than the preparation of just such books as this; and, while Dr. Samson worked out a happy conception exceedingly well in his larger work, he made a still more desirable advance towards his object, by this neat and comprehensive abridgment, which deserves and will certainly find a large sale.

A HISTORY OF THE NEW SCHOOL, AND OF THE QUESTIONS INVOLVED IN THE DISRUPTION OF THE PRESBYTERIAN CHURCH IN 1838. BY SAMUEL J. BAIRD, D. D. 1 vol. 12mo., pp. 564. Phila.: Claxton, Remsen & Haffelfinger.

Dr. Baird stands deservedly high in his branch of the Church, and claims, in the possession of the papers of his father, Rev. Thomas D. Baird, peculiar facilities for the preparation of this work, which has been called forth by the late attempts to unite the two great branches of the Presbyterian Church in America. This history is prepared by an adherent of the Old School, and of course leans towards that interest; but it appears to be carefully and well prepared, and those in search of facts bearing upon differences into which we do not enter here, for obvious reasons, would do well to consult this book.

A NEW CLASSIFICATION

OF

MODERN BUILDINGS.

SLOAN'S Architectural Review and Builder's Journal, No. 1, has perched upon my desk. Why it took this flight, I do not question. I give it welcome. Its perusal filled a pleasant hour. Its pages grew more attractive by reading. They are beautifully printed; and ornamented with fine drawings, maps, etc.

Still, I miss in the introduction and general remarks, something I expected to find there, viz.: An Architectural or Artistic Classification of Buildings at present in use. Allow me to supply it.

To define my position, I preface the following little essay with the confession, that I believe, with wise Aristotle, that in all things their *form* is the main object, or essential part.

There are, in regard to general usefulness, two kinds of buildings, viz.: HOME-HOUSES and ELEVATORS. When I define *home-houses* to be such as are surrounded with gardens and trees, the reader will easily perceive, that houses not thus ornamented, under whatever name they may pass, are comprised under the appellation of *elevators*; for whether men (*i. e.*, ladies and gentlemen, servants and children, animals and bales, grain-sacks, packages, and other things) are occupying them, and moving up and down within, or not, makes no difference. Such treeless and gardenless houses are elevators—nothing else.

Man should not resort to shelter under a roof, save when in need. Open air is his life element. How can he enjoy that, without trees and a garden spot? Consequently, the elevators never can be proper home-houses. They may have fine accommodations for ladies and gentlemen to elevate themselves; they may be palatial business places, but being

destitute of gardens and trees for respiring the heavenly air, they are, though inhabitable, inhospitable, uninviting, uncomfortable, undesirable, and not in becoming good taste. These disconsolate elevators seem to be afraid of the cool shadow of a fine, ornamental tree, of the balmy air of a flower-garden, or grass-plat. Blinds and shutters take their place. Poor people who are doomed to live, move, climb and exist in elevators! Alas!—no trees, no flowers, no turf—theirs is a dreary lot, indeed!

There is another class of buildings differing from these very much, in regard to their *apparent* stability or mobility. They may be divided into runaway (high-stoop) houses, and fast-standing houses, (English basement.) Runaway houses! how odd! But we will show that we are not indulging in Irishisms. If one, with an eye for tasteful forms, enters a street, perhaps laid out on rising ground, on both sides beset with high-stoop houses, and the stoops lined with down-sliding railings, it will appear to him as if both rows of houses are running, moving, sliding. Happy, when they are separated by trees, the images of firmness and resistance; then the bewildered eye will rest on them; the apparent mobility of these houses vanish from vision. The disenchantment will be more decided, if, perchance, one or a couple of "fast-standing" houses appear in the same street, for at once it will strike the beholder that those are really grounded, fixed, firmly-standing or—anti-runaway houses.

The Bostonians, either from want of room, or to please, or perhaps, deceive the eyes, prefer to lay the stoop within the hall. This cannot be done, without causing a wide, ugly, gaping opening in

the front wall, offensive to the metropolitan taste of the New Yorker, who places the tall, promontorial stoop in front of the main entrance, which is highly ornamented; and, too often, so heavily, that one hesitates to enter, for fear of being knocked down by the overhanging masonry. Most Boston houses belong to the elevator kind. In this crowded, venerable city they did not have the least spare room for a tree, the true land-mark of a home. Can this be the cause that the Bostonians are swarming from their cold, bleak, dreary elevators, like bees from their uninhabitable hives, over the land and the whole world, to raise—the wind?

Allow a few questions, and we have done:

1. Is it good taste, or not rather very badly monotonous, in a house—elevator or home-building—to make the doors and windows, in all the stories, of the same form, i. e., either all square, or all arched?

2. Is not the arch, *par preference*, a sign of strength or force?

3. Ought not the arch rather, for this very reason, be reserved for the foundation story, first story, and perhaps, the second story, and a different lighter form be given to the windows in the higher stories?

4. Ought not the third story, invariably, to be apparently divided by a projecting line, to please the eye with the feeling of strength and security?

5. Would it not be in good taste to line the two lower stories with brown stone, and finish the upper part with brick? or, to use granite below, and marble above?

6. Is the roof of Mons. Mansart not rather like the old, bygone ladies' coiffure of his time, i. e., that of Louis XIV.?

7. Is not the Italian taste, generally adopted in our roof building, infinitely purer and nobler, on the principle that the less we see of hats, caps, covers and roofs, the better?

8. Is the received mediæval church-building fashion indeed a good one? I have seen the principal churches in France, Germany and England, but would, if I had time, incur again, with alacrity, the fatigue of a voyage over the stormy, melancholy ocean, to see and admire once more the most beautiful *Basilica* in Munich, built by King Ludwig!

9. Ought we not to manage the streets—the beginning and end of our houses—in a better manner than up to this time? Cobble stones, everywhere at hand, are well enough at first; but when the horrible mosaic formed by them is, by hard usage, irreparably destroyed, they should be replaced by oblong square granite blocks—as the best street mosaic material—long since, and now used in Europe in such streets, bridges, etc. They should be kept well swept, to need no sprinkling, and always instantly repaired during the night, when injured or mined during the daytime.

10. Should we not prepare avenues, or boulevards, for horseflesh, and parks for promenaders; or, at any rate, separate the roads for vehicles and riders in parks as regularly from the promenades as we do it in all our streets? Horses run away, and become, at times, unmanageable in parks, too! FORM.

[There is certainly a constant and high gratification dependent upon the opportunity and habit of beholding handsome trees and shrubbery, to say nothing of the concentrated beauty of flowers; but, we are afraid, that this gratification, from its very nature, must always be rural or suburban. Our correspondent, however, evidently refers to localities of the latter kind, or, at all events, intermediate between suburban and urban. Regarded as to front pavements, Philadelphia ought to be well anchored, in the view of our essayist, because, taking her *en masse*, trees are found everywhere, often remaining long amidst the encroachments of trade. But, somehow, their use is very incidental, every man deferring the pleasure of sitting under "his own vine," until he shall have a country-place of his own.—Eds.]

SMALL HOUSES FOR THE MANY.

WHILST Philadelphia increases, northwardly and westwardly, with amazing rapidity, we are yet concerned to see, that nearly all the new buildings are either for business, or else as homes, only adapted to the occupancy of men particularly well to do. Rents have increased far beyond their strict relative proportion, and there is some fear, lest we shall not be able much longer to repeat our always hitherto truthful boast, that the Quaker City eschews tenement-houses, and provides each of her families with a separate home.

We are not addressing ourselves to that class of projectors whose one pervading idea is cent per cent. In their logic, things are always worth what they will fetch. But, in the true sense, things are not always worth what they will fetch. The mass of any community, under any form of government, will, for many generations, if not always, be the poor. "The poor ye have always with you." But, emulating the example of Mr. Peabody, our philanthropic capitalists would do well to erect well-planned, neat, and substantial blocks of little homes, specially adapted to the wants of respectable young couples starting housekeeping; require good references of reputable standing, and charge a rent not exceeding seven per cent. on the investment.

The prosperity of the rich cannot last without the prosperity of the poor. If the latter are gradually impoverished to pauperism, or even if they are denied modest little separate homes, the spirit of personal independence, whence arises public liberty, declines to extinction. The petty householders and small land-owning yeomanry of England were her real bulwark for ages. The hopeless peasantry of France were so many powder-magazines, being slowly charged for the explosion of the Reign of Terror. Our own proud stand among the nations of the earth could never have been taken or held, without the prevalent small divisions of property. Goldsmith was not exactly right. The accumulation of wealth itself is really prosperity. It is only when it all falls into the hands of a very few, that a land is ruined. Let us read him a little differently:

*"Hard fares the land to hastening ills a prey,
Where fortunes concentrate, and men decay."*

We must also remember, that the Americo-Saxon, which, from constant immigration, really is beginning to have more of the essential Anglo-Saxon blood in it, than the so called Anglo-Saxon itself, is a race like the Spanish before the days of Don Quixote, whereof every one feels himself to be

"As good a man as the king, only not so rich."

SERPENTINE AS A BUILDING STONE.

BY JOHN C. SAVERY.

SERPENTINE, recently introduced into Philadelphia as a stone for choice edifices, has long been regarded with much favor, as a building material, in Chester and Delaware counties, Pennsylvania, where it exists in great abundance.

Some of the most elegant and impos-

ing buildings in both counties are constructed of it; and it is said to preserve its freshness of appearance and beauty of color for a greater length of time than most other kinds of stone, as well as to afford the driest and most durable of walls.

Its color, which it owes to a small

admixture of chrome, is a pale green, varied in some specimens by a darker shade of the same, and when it is placed in contrast with material of another color, such as Pictou or Connecticut stone, the most pleasing architectural effects are produced.

This stone is composed of nearly equal parts of silica and magnesia;* and is by most writers classed among the marbles;† differing, indeed, but slightly in its constituents from the celebrated *verde antique* of the South of Europe.

It derives its name from the tortuous

[* The average of the analyses of some eight or ten different specimens of *Serpentine* instanced in Dana's Mineralogy, gives:

Silica,	43.
Magnesia,	41.
Water,	13.
Protoxyd of Iron, . . . . .	.75
Carbonic Acid,	2.
Lime, . . . . .	.125
Alumina, . . . . .	.125

100.

Translucent varieties of *Serpentine*, often very beautiful in color, are distinguished by the epithet *Precious*, or *Noble*; and the sub-translucent or opaque varieties are called Common *Serpentine*, such as is mentioned in the text.

† All true marbles have Carbonate of Lime as their chief constituent.—Eds.]

character of the veins in which it occurs; and which, in this region, though their general direction is northeast and southwest, show themselves on the surface at points having apparently very little relation to each other.

One of the best defined and most readily accessible of these points is in Birmingham township, Chester county; and it is there are located the quarries from which most of the stone now in use is taken.

Amongst the buildings in this city for which this material has been used, are the Baptist Church, now in course of erection at the northwest corner of Broad and Spruce streets, a chapel at Broad [or, rather, Ontario] and Master streets, and a row of dwellings on Sansom street, West Philadelphia, in which latter it has been used for window dressings.

There is very little doubt, that, as this stone becomes more widely known, its value as a building material will be more fully recognized; affording, as it does, so pleasing a variation from the monotonous effect produced by long rows of brick and brown stone buildings.

ILLUMINATING—

As most of our readers are aware—is the art of adorning manuscripts, elegantly lettered, with colors and gold. In the early Christian period, and during the Middle Ages, the vehicle was generally parchment or vellum; but since the partial revival of the practice, within a few years, paper is occasionally employed. For deeds and patents—if subjected to heat in fire-proofs, through the accident of conflagration—paper is preferable to prepared skins, as the latter shrivel and become a kind of glue, whereas the former are only a little discolored. Paper also admits finer drawing. In all other respects, fine skins are superior. The antique display, with regard to the linear contrast and harmony of the entire page, was poor and stiff; but the antique predominant capitals were

often exquisite in drawing and gorgeous in coloring, besides being pervaded with an ingenious intricacy, defying modern analysis, let alone successful imitation, as in the case of the Book of Kells. We should expect, however, modern art to excel in the entire harmony of the subject of any particular page. With respect to color, the generality of modern imitations are very good specimens of ornamental printing; but not fairly, in any sense, illuminations. The great secret of the purity and brilliancy of color lies in the fact, that the old monks, in the best ages of the art, drew without showing any black outlines; and, while generally successful in the harmonious contrasts of color, invariably separated all colors from each other by slender lines of white.

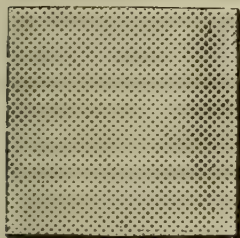
HERALDRY.

THE TINCTURES: IN COLOR, AND IN ENGRAVING*.

FROM THE OLD HERALDS AT LARGE.

OR,—

IN heraldic engraving, is signified by small round dots arranged, equably, all over the field, or any charge; and in



Tricking is denoted by the letter O. The square escutcheon, here given in illustration, is that of a Knight-banneret. This rank must not be con-

founded with that of a baronet. The banneret had a personal dignity, which expired with him: the baronet possessed an hereditary one. Bannerets belonged to feudal days,* being Knights of long approved valor, who could and did muster a certain number of retainers for the wars; baronets were not created until the reign of James I. of England, and comprised those gentlemen of ancestry and large estate, who paid one thousand pounds apiece into the British treasury, for the maintenance of troops in the province of Ulster, Ireland; to say nothing of pretty heavy fees to the Herald's College. Bannerets ranked next to barons and before baronets; and even after their husbands' deaths, bannerets' wives outranked the wives of baronets. Bannerets were allowed to bear arms with supporters; and anciently had knights-bachelors and esquires serving under them. The ceremony of the creation of knights-banneret upon the field of victory consisted in the king, or the representative general, at the head of his army, drawn up in order of battle, under the royal

banner displayed, receiving the knight-expectant, who carried his own forked, or swallow-tailed, pennon of arms, and was led between two other knights; the heralds preceding, to proclaim the valiant deeds deserving a banneretship. The king, or general, then said "*Advances, toy banneret,*" i. e., *Advances toi banneret*, advance [thou, or thee,] banneret; and either himself rent, or cut off, or caused to be cut off, the forked ends of the armorial pennon, thus leaving it square. Then the new banneret, with trumpets sounding before him, was sent back to his tent, accompanied by the nobility and officers, whom he presently entertained.

Bannerets have no particular badge, worn on their garments; but in England their arms are painted on a banner placed in the paws of the supporters of their arms. This banner, it will be understood, from the above, is square. Porney is also our authority for a banneret's shield being square.

The herald's declaration on presenting the knight-candidate for banneretship is: "May it please your grace to understand, that this gentleman hath shown himself valiant in the field; and for so doing, deserveth to be advanced to the degree of a knight-banneret, as worthy henceforth to bear a banner in the war."

OR,—Gold, or yellow,—from the Latin, *aurum*, through the French, *or*, Spanish, *oro*, Italian, *ôro*, and German, *gold*.

According to Guillim, the bright yellow of gold is compounded of much white and a little red; and "such," says he, "is the worthiness of this color, which resembles gold, (as *Christine de Pue holdeth*,) none ought to bear the same in arms, but emperors and kings, and such as be of the blood

* The first account of them is in the reign of Edward I. In 1773, at the review of the Royal Navy at Portsmouth, George III. created bannerets, Admirals Pye and Spry; Captains, Knight, Bickerton and Vernon. See History of Knighthood, by Hugh Clark, vol. I., pp. 73-4.

"royal, though, indeed, it be, in use, more common. And as this metal excelleth all others in value, purity and fineness, so ought the bearer (as much as in him lies) endeavor to surpass all others in prowess and virtue."

"Of itself," says Sylvanus Morgan, "it [gold] betokeneth wisdom, riches and elevation of mind; with *red*, to spend his blood for the riches and welfare of his country; with *azure*, to be worthy of matters of trust and treasure to keep for himself and others; with *sable*, most rich and constant in every thing, with an amorous mind; with *vert*, most joyful with the riches of the world, and most glittering and splendid in youth."

Colombiere proceeds further, and says: "Or, in armory, signifies of Christian and spiritual virtues, faith, justice, temperance, charity, meekness, clemency and humility: of worldly virtues and qualities, it denotes, nobility, riches, generosity, splendor, love, chivalry, purity, clearness, constancy, solidity, gravity, joy, prosperity, and long life: of precious stones, it represents the carbuncle, and, according to some, the topaz: of the planets, the sun: of the elements, the fire: of the human constitutions, the sanguine: of the days of the week, *Sunday*: of the months of the year, *July* and *August*: of the trees, the cypress and some say, the laurel: of flowers, the *Heliotropium*: of fowls, the cock and the bird of Paradise: of beasts, the lion: and, of fishes, the dolphin. Gold is cordial, helps digestion, comforts the stomach, cherishes the heart, and expels all humors, especially melancholy.

In short, gold may be said* to have more power than any other thing; and to surpass all simples† in virtue, and be above all minerals, exceeding all the arts of magic, as being able to shake the loyalty, or fidelity of those, who have been truly thought virtuous. Those who bear *Or* in their arms are most

obliged to defend their prince's honor, dominions and pretensions, and so to fight for them and their country to the last drop of their blood, which often gives a glorious color to their aims that will last as long as the world."

We find in *Spelman's Aspiologia*, that the most ancient shields of the Greeks were adorned with gold; and that, for the gold they used, Alexander the Great's soldiers were called *Chrysoaspides*. The Romans set up a gold shield for *Claudius Augustus*, because he removed the most valiant nation of the *Goths* from the frontiers of the empire.

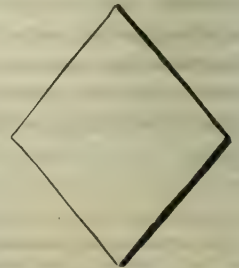
To what has been said, above, of the signification of this metal in composition with colors, Leigh adds, that, with *Purple*, it denotes a friend to his enemy; with *Tenné*, patient in trouble; with *Sanguine*, trusteth and soon deceived. Much more is said by this same author in commendation of this metal; but as he is apt to be ever redundant in words we shall dwell no longer on him.‡

We add from Samuel Kent's "Banner displayed: or Guillim Abridged,"—which, however, is really an independent work and hardly leans upon Guillim for more than the compulsory heraldic precedents—Caption: Yellow—"This colour, * * * * * is said to signify wisdom, riches, magnanimity, joyfulness and elation of mind."

ARGENT,—

IN the productions of herald-engravers, is expressed by an untouched white surface; and in Tricking is marked

A. The shield here given will be recognized as that of a woman: and a number of ladies' escutcheons are introduced in this division to exemplify the method



* All this is through its purchasing use.—C. J. L.

† Medicinal herba.

‡ So far James Coates in his "New Dictionary of Heraldry." [Author's name not in title-page.] 1 vol. small

of expressing the different tinctures in engraving, because they are better adapted to that purpose than to the proper display of armorial figures to the uninitiated. They must, therefore, appear now, or not for an indefinite period.

ARGENT:—*Silver*, French and Portuguese, *Argent*, Spanish, *Argento*, Italian, *Argento*, is from the Latin, *Argenteus*, representing the metal and not *albus* or *candidus*, which only refer to the color *white*. However, in heraldry, white almost invariably represents this tincture in painting—as it always does in engraving—because silver being apt to tarnish, the proper effect and beauty of scientifically and artistically colored arms would be lost in a very short time, if silver leaf, or silver shell, were used.

"White," says Guillim, "is a color that consists of very much light, as described by Scribonius, *Albedo est color simplex in corpore tenuiore nulla luminositate constans*, to which black is contrary. As colors may be resembled to things of greatest nobility, or reputation, so is their worthiness accounted of accordingly. The color *white* is resembled to the light, and the dignity thereof reckoned more worthy than the *black*, by how much the light and the day is of more esteem than darkness and the night, whereunto *black* is likened. Furthermore *white* is accounted more worthy than *black*, in respect of the more worthy use thereof; for men in ancient times were accustomed to note things well and laudably performed, and esteemed worthy to be kept in memory, with *white*; and contrariwise, whatsoever was holden reproachful, or dishonorable, with *black*. In composition of arms it is accounted worthy of blame to

"blazon this otherwise than *Argent*; but in doubling of mantles it is not so taken; for therein it is not understood to be a metal, but the skin or fur of a little beast. This fur was heretofore much used of the ancient matrons in London. The Spaniards call this field *campo de plata*, a silver field."

According to Colombiere, "White signifies of virtues and spiritual qualities, humility, purity, innocence, felicity, temperance and truth; of worthy good qualities, beauty and gentleness; of the planets, the moon; of the four elements, the water; of human constitutions, the phlegmatic; of precious stones, the pearl and the crystal; of trees, the palm; of flowers, the lily, or flower-de-luce; of beasts, the ermine, which is all white, without any spot; of the parts of man, the brain; and of his ages, the old."

Argent also signifies, chastity in a woman; virginity in a maid; justice in judges; and humility in the rich. Coates says, he has read, "in a Spanish author, that those who have Argent in their arms are obliged to relieve maidens and orphans. The only person we ever read of that bore a field *Argent*, without any charge, is one of the redoubtable worthies of King Arthur's Round Table, surnamed the Good Undaunted Knight. But as we know little of those knights, we shall not urge this instance, nor any other thing that may seem romantic, as most of those stories of the Round Table are supposed to be." Sylvanus Morgan says: "*Argent*, or *White*, with *Red*, signifies bold in all honesty; with *Blue*, courteous and discreet; with *Black*, wholly studious to the contemplation of Divine things, yielding up all pleasure; with *Green*, virtuous in youth to the continuance thereof; with *Purple*, judicature with magistracy by the favor of the people."

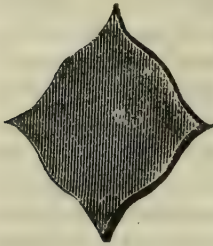
Kent tells us, that, after Leigh, "White signifies chastity, virginity, a clear conscience, and charity."

Svo., octavo, pp. XIV. 352—7 folding Copperplates, 194 well-engraved illustrations. Printed for Jer. Batley, at the Dove, in Pater-Noster Row, London, 1725. An exceedingly valuable repository of heraldic information. Freely used in this article because it is rarely to be met.

C. J. L.

GULES,—

RED.—in armorial coloring always understood to be vermillion, in Latin, *ruber*; in Spanish, *roxo*; in



German, *roth*; French, *rouge*; Italian, *rosso*—is presented by armorial engravers in perpendicular lines, for the whole, or any portion of a

shield, or charge, so colored; and is given in Tricking by the letter G.

According to Coates, Scribonius defines this tincture, *Rubedo est color equali simul Albedinis et Nigredinis combinatione constans*, consisting of an equal mixture of white and black. It represents fire, which is the chiefest, lightsomest, and clearest of the elements. MacKenzy supposes the name *Gules* to be derived from the Hebrew word, *Gulude*, a piece of red cloth; or from the Arabic word, *Gule*, a red rose, as Menestrier observes.

Sylvanus Morgan says, it denotes the power of the ALMIGHTY; and, in moral virtues, it signifies, prowess, boldness, and hardiness; with *Gold*, a desire to conquer; with *Argent*, avenging the innocent, and beating down the envious.

The ancients used this color, to make themselves terrible to their enemies, and to stir up magnanimity. Both the ancient Egyptians, and the ancient Britons, esteemed this color above all others.

Colombiere observes, that Martial calls this color *rutilus* and *ruffus* in these verses,

*Roma magis fuscis, vestitur Gallia ruffis,
Et placet hic pueris, militibusque color,—*

Where we see, that the Gauls were fond of this color, and that it was then agreeable to youth, and to soldiers. The same author adds thus,—Some ancient heralds have called this color warlike

vermillion, the color of blood and scarlet; and the name of *Gules* has been given it, as Feron says, "Because all beasts, when they devour their prey, have their throats—in French called *Gueules*—bloody and full of red."

Of spiritual virtues, *Gules* denotes Justice, Charity, and an Ardent Love of GOD, and our neighbor; of worldly virtues, Valor, Fury, Nobility, Hardiness, and Magnanimity; of vices, Cruelty, Choler, Murder, and Slaughter; of the planets, Mars; of human constitutions, the Choleric; of precious stones, the Ruby; of metals, Copper; of trees, the Cedar; of flowers, the Peony,* the Clove Gilliflower, and the Pink; of birds, the Pelican; of the days of the week, Tuesday; of the months of the year, March and July; of the ages of men, the Manly.

Those who bear *Gules* are obliged to relieve such as are oppressed by injustice, or, as a consequence, to Avert Wrong if they can.

Spelman, in his *Aspilogia*, says this color was honored by the Romans, as it had been before by the Trojans, for they painted the bodies of the Gods, and those of the Generals that triumphed, with *vermillion*. The Roman soldiers under the consuls wore red, and were, therefore, called *russati*. No Roman was allowed to wear it, without the prince's leave.

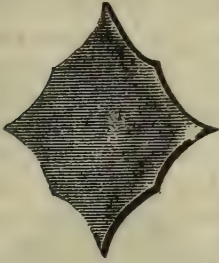
St. Isidorus writes of this color thus: RUSSATA VESTIS, QUAM GRÆCI PHENICEAM VOCANT, NOS COCCINEAM, REPERTA EST A LACEDEMONIJS AD CELANDUM, COLORIS SIMILITUDINE SANGUINEM. The red garment, which the Greeks call *Phœnician* and we *scarlet*, was first used by the Lacedemonians, to prevent, by the tint of the garment, the detection of blood lost in battle.

Kent derives *Gules* possibly from the Latin, *Gula*, the throat, whence came the English word gills, for the throat part of fishes, always red.

* Or Piony.

A Z U R E , —

BLUE, is expressed in armoristic engravings by horizontal lines, drawn regularly over every portion of a field,



or a figure, so colored. In Tricking it is marked with the letter B, in order to distinguish it from Argent, which, being first in order, has

therefore appropriated the letter A, black, we may add, taking the letter S, for sable.

AZURE, from the French *azure*, is in Latin, *Cyaneus*, *Cæruleus*, and *Asureus*, the latter being the real original of the heraldic term. Garibay, in his *Discourse of Arms*, says, the Spaniards call it *Azul* and *Blau*. The Italians have *Azzurro*, *Azzurrino*, and *Turchino*; and the Germans, *Blau*.

"Blue," says Guillim, "is a color, which consisteth of much *red*, and of little *white*, and doth represent the color of the sky in a clear, sunshiny day. *Ceruleus color a Cælo dictus est, quod tanquam solers et diligens nescit otiosi.*"

Colombiere has these words of it, "The *Azure*, by some called the *Saphir*, and sky color, and by others *Turquine*, is what we commonly call *Blue*, and which we prefer in France before all other colors, because it is the field of the arms of our kings, and for its representing the sky, or heavens, which is the highest of all things created, the tribunal of GOD, and the everlasting mansion of the blessed."

This color signifies Justice, Humility, Chastity, Loyalty, and Eternal Felicity; of worldly virtues, Praise, Beauty, Meekness, Nobility, Victory, Perseverance, Riches, Vigilance, and Recreation; of the planets, *Venus* and *Jupiter*; of the days of the week, *Wednesday* and *Friday*; of the months of the year, *September*; of the elements, the *Air*; of meta's,

Tin; of precious stones, the *Turkey Stone* [i. e., *Turquoise*]; of trees, the poplar; of flowers, the violet; of four-footed creatures, the chameleon; of fowls, the peacock; of human constitutions, the sanguine; and of the ages, youth.

The ancient Heralds say, those who bear this color in their arms are obliged to assist and protect the faithful servants of princes, who are deprived of their wages.

Samuel Kent says, Blue is the color of the heavenly canopy, representing the planet *Jupiter*, and the beautiful *Sapphire* [sapphire]. It is called *Azure* by a corruption of the word *Lazulus*, of *Lapis Lazulus*, [Lapis Lazuli,] a certain sort of blue stone. It shows the bearer to be of a Godly Disposition of Perpetual Renown.

Coates thinks *Azure* must certainly be derived from the Italian, *Azurro*, or the Spanish *Azul* [*l* and *r* being commutable]; but the Latin, *Asureus*, as given above, definitely settles the case.

S A B L E , —

BLACK, expressed in engraved blazonry by perpendicular and horizontal lines crossing each other, and in Tricking, by the

letter S,—is from the French word, of the same heraldic import; *Sable*, which, however, in France, ordinarily means *sand*



or *gravel*; thus agreeing with the Latin, *Sabulum*, coarse sand or gravel; whence Guillim supposes it to be derived, in respect of the heavy and earthy substance, wherein darkness abounds above all others.

MacKenzy, with much more reason, in the opinion of Coates, believes *Sable* to be so named, because the best sable furs are black.

Some there are who will not allow

black to be a color, but that we shall not enter upon, all heralds calling it a color ; and using it as such ; and, as such, it is much inferior in dignity to white, as representing darkness, as the other does light ; and, consequently, is the emblem of horror and melancholy ; and, therefore, mourning is black, as indicating a disconsolate and heavy mind.

However, Sylvanus Morgan says, " It is the first of antiquity ;" and he is correct, forasmuch as dark was before the light ; and yet the latter is of greater dignity.

It is accounted simple, because it needs no other color to make it absolute, and communicate itself to all other colors.

Coates thinks the cross-hatching for Sable, in engraved armories, is natural, as expressing blackness or darkness. In Latin, it is called *ater* or *niger*.

Colombiere tells us that the ancient heralds gave black the name of *sable* because it comes from the earth, being the first color in nature, and the last in art ; as also, because there is a sort of sand called, in French, *sable*, which scours and cleans *arms*.

Of the virtues and qualities of the soul, it denotes Grief, Simplicity, Wisdom, Prudence, and Honesty ; of the planets, Saturn ; of the four elements, the earth ; of human constitutions, the melancholy ; of metals, lead and iron ; of precious stones, the diamond ; of trees, the olive ; of birds, the crow or the raven ; and of the ages of men, the last, which inclines to dotage.

Those who bear *sable* in their *arms*, are obliged to relieve widows, orphans, churchmen, and the learned, that are under oppression.

Leigh, in his *Accidence of Armory*, will have it that Sable, of itself, signifies Constancy, Divine Doctrine, and Heavenness for Loss of Friends ; with *Or*, honor with long life ; with *Argent*, fame ; with *Gules*, to be feared of his enemies ; with *Azure*, studious to appease strife ; with *Vert*, after great sorrow, much joy ; with

Purple, religious to the death ; with *Tenné*, unquietness hindereth his desire ; with *Sanguine*, prosperous. He adds that when the field is *Or*, and the thing which is charged upon the field is *Sable*, that coat is most rich,* because when the diamond is set in gold, the metal honoreth the stone, and the stone the metal ; whereas, if it were set in silver, the stone would honor the metal, and the metal would abase the stone ; and so that color is most rich when it is set in the richest field. When the field is *Argent*, and the charge on it is *Sable*, that is the fairest, because they set off one another, as light and darkness, and are farthest seen.

According to Upton, *sable*, or *black*, is the privation of white in perspicuity, as bitter is the privation of sweetness in moisture ; and blackness is produced by little and obscure light. He adds : That though black be the second principal color, yet, in bearing of arms, the field *sable* is not very commendable ; but the field *white*, with *black* spots, which is *ermine*, he highly applauds, whereas, on the contrary, he wholly disapproves of *ermine*s, which is the field *black* and the spots *white*.

Coates cites Colombiere to the effect that, " Though it be rare to find any that, by way of arms, have no charge upon the field, yet the Counts or Earls of *Gournay* formerly bore only the field *SABLE*, without any charge upon it." The arms are right, but the name is misprinted ; it should be, as per Vallemont above, the Counts of *Tournay*.

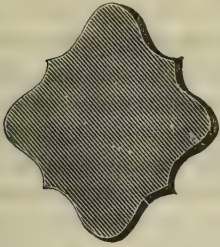
Kent says : " Black, though the ancientest of all colors, (for *darkness* was before *light*, and without *light* all is *black*,) yet, as it is the color of mourning, possesses the fifth place. *Saturn* is the

* The Arms of WILLIAM SHAKESPEARE are : " *Or*, upon a bend *Sable*, a tilting-spear of the *first*, headed *Argent*. Crest : A falcon, with wings displayed and addorsed, *Argent*, holding in his dexter talon a tilting-spear, in pale, *Or*, pointed of the *first*," [or, as Clarendieux Cooke has it, "*steeld sylver*."] Motto, " *Non sanz droiet*," in modern French, "*Non sans droit*," i. e., " Not without right."

planet to which it is compared; the stone is the *diamond*. It is termed *sable* from the Latin *sabulum*, which signifieth *gross sand*, or *gravel*. It signifies to the bearer Constancy, Divine Doctrine, and Loss of Friends."

VERT, —

GREEN, typified in the engraved blazonry by oblique lines, all over



any escutcheon or any bearing, parallel to a line drawn from the dexter chief point to the sinister base point, and shown in Tricking by the

letter V,—is the common French word for green, and has that sense with the English heralds; but the French heralds themselves—it being thought necessary, in science and art, to get a little apart from the common speech of mankind—employ technically the word *sinople* for green. In Latin it is called *viridis color*; in Spanish, *verde*; in Italian, *verde*; and in German, *grün*, which conveys both the natural and the heraldic meaning.

Of this color Guillim speaks thus: "Green consisteth of more black and of less red, as appeareth by the definition, *Viridis est color nigredine copiosiore et rubedine minore, contemperatus*. The French heraldic term, *Sinople*, is from the name of a town in the Levant, where the best materials for dyeing green are found."

Colombiere says: "Synople is so called from the Latin word *synopsis*, which is a sort of clay or mineral, found in the Levant, very proper for dyeing green."

Green, among Christian virtues, denotes Charity and Hope; and among the worldly, Honor, Courtesy, Civility, Love, Joy, and Plenty. Of the planets, Mercury; of the elements, the earth; of men's constitutions, the phlegmatic; of

precious stones, the emeraud [emerald]; of the days of the week, Wednesday; of the months of the year, April and May; of metals, mercury or quicksilver; of trees, the laurel; of flowers, the Everlasting; of birds, the parrot; and of the ages of men, youth.

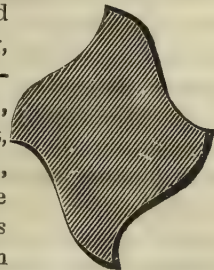
Those who bear this color in their arms are obliged to support peasants and laborers, and particularly the poor that are oppressed.

With *gold*, according to Sylvanus Morgan, it denotes Pleasure and Joy; with *silver*, Innocent Love, and a Sure Tenant.

Kent says: "Green, a most beautiful color, and very pleasant to the sight, comes next, being resembled to the gladsome planet, *Venus*, and to the glittering *smaragd* or *emerald*. In blazon we call it *vert*, from the French *verd*, [same as *vert*,] which is derived of the Latin *viridus*, signifying *green*. It shows in the bearer Joyful Love, Bountiful Mirth and Gladness, with Continuance."

PURPURE, —

PURPLE,—expressed by heraldic engravers with diagonal lines, drawn from the sinister chief point to the dexter base; and marked, in Tricking, by the letter P,—from the French, *pourpre*, and that, again from the Latin, wherein this tincture is titled, *Purpureus Color*. It is, in Spanish, *purpura* and *morado*, in Italian, *porporino* and *pavonazzo*, and in German, *purpur*.



Guillim says: "Purpure is a color, that consisteth of much red, and a small quantity of black, and is thus described, *Purpureus Color est, quia multa rubedine, et pauciore nigredine commiscetur*." Chassaneus, having spoken of the six colors, white, black, red, yellow, green and blue, remarks, "That, of them all, being compounded and mixed together,

according to proportion, this purple color is raised. It has its denomination of a certain shell-fish, called in Latin, *purpura*, which was formerly chiefly found near the famous city of Tyre, in Phœnicia. From this fish the Tyrians drew a liquor, with which they dyed purple, and therefore this was called *Tyrius color*. This was in those days when they knew no other way of dyeing this color; and therefore, it was excessive dear, and only fit for the greatest persons. Afterwards, the scarlet berries were found upon the scarlet oak, which exceeded the beauty of the former color; and since then the West India *cochineille* has put down both."

The French admit *Purpure* to be a color in Heraldry, although Favin and some others, of that nation, take it for *tarnished silver*, which appears purple to the eye.—COATES.

Sir George Mackenzy observes, that this color has been particularly privileged, he having seen it used, both as a metal, and as a color, which he conjectures, in one place, is because it is a royal color. But, "I rather believe," says Guillim, "that in such coats it may be silver tarnished, and so in time taken for purple;" and this Mackenzy himself, in another place, seems rather inclined to receive.

Notwithstanding the opinions of these famous men, it seems very improbable that *purpure* should be only *tarnished silver*, because, if the field had been originally silver, the change on it must, of necessity, have been of some color, and not a metal, as being false heraldry. Besides that, silver upon silver could never have appeared; and yet many instances might be brought of purple fields with the bearings of metal. But one—which I find in Sylvanus Morgan, p. 20,—may serve for all; and that is "*Purpure, three bezants*," the arms of the family of *Pace*. Now bezants are well known to be always gold, so that they could not be charged upon silver; and hence I think it follows, that *pur-*

pure, or purple, must be a color and not tarnished silver.—JAMES COATES.

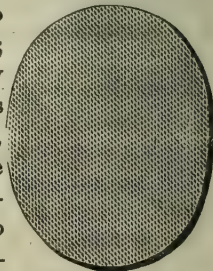
Garibay, in his *Treatise of Arms*, does not allow of Purple in heraldry; nor, indeed, of any colors, besides *Gules*, *Azure*, *Vert* and *Sable*, but it is plain that he was not very knowing in this science of heraldry; besides that, perhaps in Spain the purple might not be admitted, though it was in other countries.

Spelman, in his *Aspilologia*, allows Purple the preference, before all the other colors, as having been an ensign of royalty for many ages; yet, he says, it seems to be excluded by ancient heralds as being an imperfect color. It is indeed an uncommon color, yet there are to be found sufficient examples of the use of it; and, therefore, as both French and English heralds have given it a place among the tinctures, it seems unreasonable to attempt its exclusion.—COATES.

Kent observes, "Purple is a princely color, yet appropriated to the planet Mercury, that is, by the poets, said to be servitor to the rest. Its stone is the *Amethyst*. We term it, in blazon, *Purpure*, which is derived of the Latin, *purpura*, the name of a sort of shell-fish, of whose blood this color was first made. It shows *jurisdiction* and *justice*."

TENNÉ,—

ORANGE,—expressed by engraver-armorists in perpendicular lines, crossed by diagonal ones from the dexter chief point to the sinister base; is also given, by some authors, as vertical lines, crossed by oblique ones from the sinister chief point to the dexter base; although there can be no uncertainty or ambiguity here, because this is the only tincture represented by perpendicular lines crossed by oblique ones, no matter from which side; and is denoted, in Trick-



ing, by the letter T. It is the same color which we commonly call tawny. As tawny, its common adjectives in Spanish are *curtido* and *moreno*, the first referable to *leather*, weather-beaten, and the last swarthy. As orange, the Spaniards would call it *color de naranja*. In French it is *tanné*, tan-colored, and *orangé*; and in animals *fauve*. The Italians make tawny, *bruno*, *abbronzato*, and *fulvo*; and orange, *color d'arancia*. In German, orange-color is *pomeranzenfarbe*; and tawny, *lohfarben*, *braungelb*, and *schwarzgelb*, the word *loh*, *lohe*, being *tanning-bark*, and the word *gelb*, yellow. It will be seen that our own word *fulvous*, Latin *fulvus*, is included in these linguistic variations. It is perceptible that in none of these languages are orange and tawny exact synonymes, as they seem to have been taken by the heralds, orange being bright, and tawny dull, of the same general combinations of colors.

Concerning *tenné*, Leigh says: "It is a color of worship, and of some heralds called *brusk*, most commonly borne by French gentlemen, but very few do bear it in England." "It is," adds he, "the surest color, that is, of so bright a hue, being compounded, for it is made of two bright colors, *red* and *yellow*."

Guillim says, "This color is used by the French;" and the French heralds observe, "That the English use it." MacKenzy thinks Mr. Guillim is in the wrong, and the French in the right; "for," says he, "the French use it not, but the English do."

Leigh instances two ancient English families that have long borne tawny in their arms, namely: Hounzaker and Finers; but their blazons do not seem to have come down to us.

George Field, in his "Grammar of Coloring," makes "*the engaved lines for TENNÉ run as most heralds give them for SANGUINE, namely, crossed in saltire, and vice versa*;" but this is undoubtedly a mistake, arising probably from Coates having, firstly: either omitted the engrav-

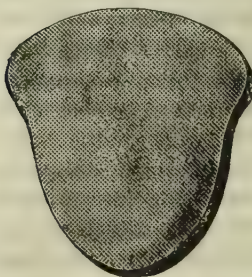
ing of *sanguine* altogether, or carelessly described the lines for *tenné*, in lieu of those for *sanguine*, by "it is expressed in engraving," &c., just after instancing the houses of the *Hounzak*ers and the *Finers* as containing *tenné*; and, secondly: describing *tenné* by "lines diagonal from the sinister chief and transverse." Coates' figures are, for *sanguine*, diagonal lines, conforming to the direction of both limbs of a St. Andrew's cross; for *tenné*, *horizontal* lines, crossed by others from the sinister chief to the dexter base. This last gives a third variation of lines for *tenné*; but, allowing *sanguine* to be definitely fixed, can cause no confusion, for in each of the three the lines cross at an oblique angle, and neither of the variations at all resembles the lines appropriated to any other tincture.

Coates tells us, "That this color is little or not at all used by the French, * * * sufficiently appears by its not being so much as named by Colombiere and others of France; nor do I find that, among the English, Sylvanus Morgan takes any notice of it. Spelman, in his *Aspilogia*, will scarce allow of this color, though, as he there observes, called worshipful by Leigh, yet just below he places it among the colors, assigns to it in heaven the Dragon's Head, and among precious stones the hyacinth. In Latin he calls it *amaranticus*. I find it not anywhere used in Spanish."

Kent says, some heralds term *Tawny*, *Bruske*, but the proper name is *Tenné*, deduced from the French, *Tanné*, or the Italian *Tanetto*, a chestnut color, to which it is not unlike. It is not compared to a planet, the seven being taken up already, but to the Dragon's Head, a star, which partakes of the nature of a planet, and, among stones, to the *Jacinth*. This being one of the stainand [stainant, staining, for abasing] colors, can have no very good interpretation set on it. Leigh saith, it signifies vain-glory. It is also written *Tenney*, the true English sound.

SANGUINE,—

MURREY,—by armorial engravers depicted by two sets of diagonal lines, one set from the dexter chief point



to the sinister base, and the other from the sinister chief to the dexter base point; and in Tricking by the letter M,—variously explained “dark red” and

“blood red;” and which, in the absence of any absolute description by the authorities, we surmise to have been, either crimson-lake, or carmine, or at least a red inclining towards purple. It was in heraldic Latin called *color sanguineus*. The Spanish heralds did not use it. In French, *Murrey* is defined by *Rouge foncé*, dark or deep red; in German, by *dunkel Braun*, dark brown, and *dunkel Roth*, dark red; and in Italian by *di color rosso oscuro*, of a dusky or dark red color.

Leigh says: “Sanguine is a princely color, being, indeed, of the colors appertaining, in ancient time, to the Prince of Wales. It is a color of great esteem and very stately, and used in some robes of the knights of Bath.”

Some heralds will not allow *Sanguine* and *Tenney* to be used in heraldry; but it is certain they have been used.

I do not find, that Colombiere takes any notice of this color, whence I conclude it is little, or not at all used by the French or Spanish heralds. Sylvanus Morgan does not speak of it; nor does Spelman allow of it, although he says, it represents in heaven, the Dragon's Tail; and, among precious stones, the sardonyx.—COATES.

Kent remarks: “*Murrey*, but in blazon sanguine, i. e., Blood red, is the other stain and [staining] color and the last we have to treat of. The signification of it in arms is, *That the Bearer was not over hasty to Battle, yet overcame.*”

D. B. Hay, in his excellent “Nomenclature of Colors,” [12mo. p. 72, with 240 contrasted colors, tints and hues, Edinburgh and London, W. Blackwood & Son, 1845,] treats succinctly of this Heraldic lore, saying that it originally only acknowledged *white*, *black*, and the three primaries, *red*, *yellow*, and *blue*; that *green* was added in the reign of Richard II. and *purple* about the middle of the sixteenth century; and gives the armorial nomenclature, as already explained in detail, as “all but uniform all over Europe.” Following Nisbet, he derives *Gules* from the Latin *gula*, the throat, or the Arabian word *gules*, meaning a *red nose*. This latter, rather, computatorial derivation is, not unlikely, an old-time printer's devil's substitute for a *red rose*; at any rate, good proof-reading would have caught the *Gulistan* or *Rose Garden* of the Persian poet Saadi. Hay adds, “at a more recent period, other two colors were introduced, called *tenney* and *sanguine*. These correspond to orange and russet, the latter being described as a duskish red.” Say rather to orange and crimson. True russet is only a warm brown, often exhibited perfectly by oiled or varnished walnut wood; and the brightest russet we know, *Indian red*, is a very poor blood color. Hay proceeds, “The use of these two colors [*Tenney* and *Sanguine*] has been almost exclusively confined to the Germans and the Dutch.”

Where shall these two poor colors rest?

NOTE.—In addition to the Simple Tinctures, as above, there are the HERALDIC FURS and the COMPOSITE TINCTURES, along with those formed in the lines of the Ordinaries, such as *Barry*, *Paly*, *Bendy*, *Pily*, *Gyronny*, etc., and that allied class formed by the French method of *tiercing*—all of which will be considered in their due order. First, the FURS; and the others, as they can most readily and surely be mastered by the reader; regular progression and clearness being an object in our course.—C. J. L.

STATUARY ON BUILDINGS.

NOTHING gives such life and effect to an architectural elevation as well-designed and judiciously located statuary. It is only now that this most desirable addition appears to be obtaining amongst our professional brethren; and that but cautiously, as though it were an innovation on the dullness of hitherto accepted mannerism.

Mr. THOMAS, of New York city, has, in his PARK BANK design, pioneered the way for other architects to follow; and, whatever critics may say, as to the number and size of the figures, in proportion to the size of the building itself, or its detail, we cannot but feel grateful to Mr. Thomas, for the lead he has taken in so very desirable a field, as that of the application of statuary to exterior architecture; and we hope to see that lead judiciously followed in our new public buildings, all of which are susceptible of such decorations; some more, some less. Theatres, museums, and, in fact, all places of public entertainment are legitimate locations for suggestive statuary, almost to profuseness. But, on the other hand, there are public buildings which will not admit of more than one figure. Such, for instance, are court-houses, post-offices, &c., where

Justice, Mercury, or some appropriate deity may preside alone.

This introduction of statuary cannot fail of benefiting that splendid sister art, which it should be the desire of every architect, possessed of the genuine spirit, to foster and encourage. The genius of our countrymen in this has been but little favored hitherto. Yet the small band of devoted artists have made themselves individually eminent, by their too few works; and the names of POWERS, CRAWFORD, HOSMER, WOLCOTT, and others, do honor to sculpture, and evidence the necessity for a liberal patronage of that art.

There is something very pleasing in the appearance of a well-proportioned statue crowning the pediment of a stately building; and if, where windows are uncalled for, in a front, yet niches are desirable, to fill up a composition, what so appropriate as to supply those niches with graceful statuary?

At present, the works of our artists are confined chiefly to parks and pleasure grounds; but a nobler sphere should be theirs; and that is the one to which we just alluded: for SCULPTURE is the favorite daughter of ARCHITECTURE; and, as such, is entitled to pre-eminent distinction in her train.

FORMATION OF ALPHABETS:—

THE ROMAN AND THE GOTHIC.

THE ROMAN, or *White Letter*, differs from the *Old English*, or *Black Letter*, and *German Text*,—both the latter generically *Gothic*—in the broad-nibbed pen, with which all were originally formed, being brought down at a right angle with the line of reading, for the heavy strokes or “shades” of the letters. The pen-nib—in profile running down to a sharp corner underneath—being always steadily kept at the same invariable angle—no matter what its movements, or curves, to form the letters—gave the “lights,” or hair-strokes, and all the transition sweeps of the particular letter, without further care. In *GOthic* letters, the same broad-nibbed pen afforded all, except the mere fancy flourishes,

by being simply kept always at an angle of 45 degrees with the reading-line. If the reader will take two fine lead pencils—say Faber No. 3, or some corresponding grade of other make—of the same length when sharpened, tie them securely together, at both ends and in the middle, so that they are parallel and cannot waver; and then employ either of the above methods of holding, according to the style needed, he will probably be surprised to find himself forming, with a single sweep, capitals nearly as well shaped as those of the printer or the sign-painter. He will learn, also, the origin of certain apparently unaccountable outliers or excrescences in Latin letters of the olden time.

C. J. L.

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING.

No. 1.

IN submitting to the pages of the "Architectural Review" a series of papers on the above-named subjects, I would desire to preface them with the remark, that the term gardening is here used in its widest and most comprehensive sense; not merely as an art either of strict or restrictive utility, as exemplified in the cultivation of fruits, vegetables and flowers; but, while all this is included, it also implies every thing relating to the location of rural residences and their domestic auxiliary structures; the decoration of grounds for the purpose of beautifying and enriching the surroundings of homesteads and public buildings; together with all that may be necessary in the artistic arrangement of arborescent growth, so as to produce the most distinct, striking and varied beauties of which the scenery is susceptible.

"Gardening," Bacon remarks, "is the purest of human pleasures; it is the greatest refreshment to the spirits of man, without which buildings and palaces are but gross handiworks; and we shall ever see, that, when ages grow to civility and elegance, men come to build stately, sooner than to garden finely; as if gardening were the greater perfection."

In comparing the relative progress of architecture and gardening, at the present time, it must be admitted, that the "Sage of Verulam" has spoken in a prophetic manner.

We are not, however, prepared to insist upon the claims he has made for gardening over that of architecture, as being the "greater perfection." Man, emerging from a rude to a civilized condition, will naturally endeavor to secure comfort and convenience, before he consults either elegance or ornamentation.

The cave in the rock is superseded by some species of external structure, although it may be as rude as the huts of the ancient Romans, whose walls were formed of mud and roofed with the bark of trees. The external surroundings of such buildings may not even reach to the extent that Walpole allows for the gardening of the ancients, "a slip of ground sufficient for a cabbage-plant and a gooseberry bush." Utility always precedes the merely ornamental, therefore, architecture and gardening stand, in some measure, in the same relation to each other, as that presented by comfort and luxury; and take precedence accordingly.

History proves, that a taste for gardening has kept pace with the progress of civilization, and always exercised a powerful influence upon the passions and feelings of mankind. Much of the decorative beauty of architecture has been derived from the study of the graceful lines and compositions of the vegetable kingdom. It has been remarked, that the principal enrichments of the Gothic are derived from the bud or germ, the Grecian from the leaf, and the Indian from the blossom. We are told that Hiram ornamented with lilies and pomegranates the celebrated pillars that he wrought for Solomon. The embellishments of Indian buildings are modelled from the flower of the lotus; and columns were suggested by the towering trunks of the palm trees. The beautiful enrichment of the Corinthian capital is said to have been suggested by a basket covered with a tile, that happened to be placed over a root of the acanthus. The stalks and foliage had spread around the sides of the basket, the points and leaves being reflexed by the tile. The elegance and novelty

produced by this chance arrangement, so delighted the celebrated architect, Callimachus, that he adopted the form, as a capital to his pillars.

Gardens are of the most remote antiquity. Our first parents were placed in a garden; and the writings of the oldest historians and poets contain various traditions and descriptions, relative to the extraordinary beauty of gardens. Cyrus, the younger, was celebrated for his pleasure-grounds at Lydia, two thousand years before the Christian era; and they were reckoned at that day amongst the wonders of the world. The hanging-gardens of Babylon seem to have been a grand combination of wealth and skill. The gardens of Jerusalem have been elaborately described. King Solomon's contained the hyssop "which springeth out of the wall," odoriferous and showy flowers, as the rose, and the lily of the valley, the calamus, camphor, spikenard, saffron and cinnamon; timber trees, as the cedar, the pine and the fir. Solomon says: "I made me gardens and paradises; and I planted in them all kinds of fruit trees. I made me pools of water; water with them the groves flourishing with trees."

The Greeks copied their gardening, as they did their architecture, from the Persians. Epicurus delighted in the pleasures of the garden; and made choice of one as a spot for teaching his philosophy. Plutarch informs us, that Cimon, the Athenian general, planted the Academus or public garden at Athens; conveyed streams of water to it; and laid it out in shady groves, planted with the olive, the plane and the elm; and provided it with gymnasia, or places for exercise and philosophic walks. At the entrance was the first altar dedicated to Love.

The Romans, also, paid great attention to the embellishment of their grounds. Lucullus had sumptuous villas in many parts of Italy, so that by changing from one to the other,

which he boasted of doing "with storks and cranes," he enjoyed an agreeable climate every month in the year. Cicero expatiates upon the beauty of the groves he had formed at his Arpinum villa; on the streams that passed through them; and of the absence of all appearance of art and of all false ornament. Sallust, after making his fortune in the Government of Numidia, laid out an extensive garden at Rome, highly ornamented with sculpture, parterres of flowers, and murmuring streams, which was, for a long period, the pride of the city.

The villa Laurentina of Pliny, the Consul, was, according to his letters, a charming spot. He gives a glowing description of the beauty of his woods, his rich meadows covered with cattle, the bay of Ostia, the scattered villas upon its shore, the blue distance of the mountains, his porticos and seats for different views, and his favorite little cabinet, with his couch where he reposed, and from which he had one view of the luxurious landscape at the head, another at the foot, and a third at the back.

The progress of architecture among the Romans was much greater than that of gardening. Their authors only mention gardens in a general manner; and approbation is bestowed on their fertility and beauty, while their buildings are described with elaborate minuteness of detail. They appear to have directed their attention, more particularly, to every thing that bore the impression of grandeur and magnificence; and had a great passion for erecting baths, circuses, colonades, statues, reservoirs and other objects that were striking to the eye. These produced an immediate impression; and did not require so much time to mature, or so much patient waiting for ultimate effect, as is the case with beauties derived from the comparatively slow development of artificial groves and plantations. Cicero refers to the delight the Romans had in displaying their wealth in the architecture of their country villas, a delight which

is not obliterated, even at the present day.

That the Romans admired natural scenery, with as much enthusiasm as nations of more modern times, is manifest from the writings of their poets and historians. That they also considered excellence in the culture of culinary vegetables a great, or at least a praiseworthy acquirement, is evident from the fact that many of their family surnames were derived from some fruit or vegetable, in the culture of which they became noted. Such are the Piso, the Fabii, the Cicero, and the Lentuli. In colonizing a country, they introduced their knowledge of science and the arts among its inhabitants; and a degree of wealth and prosperity followed in their footsteps, such as the world has rarely seen.

But history informs us, that with the fall of the Republic the taste for country life was extinguished. The abodes of wealth and grandeur were ruthlessly destroyed; and the reign of barbarism was triumphant. Pruning-hooks were turned into swords; and the earth was cultivated only from dire necessity. Architecture was encouraged, so far as concerned the building of castles, fortifications and other warlike structures; and, under later ecclesiastical rule, the erection of convents and churches; and

those were considered countries of the greatest eminence, that were the richest in convents. Knowledge slept on the shelves of the fathers. The feudal system induced some activity in rural pursuits; but gardening was only preserved by the inhabitants of the convent and monastery, who, for five centuries, were almost the only class in Europe that employed themselves in the culture of fruits, vegetables, flowers and medicinal plants. All honor, therefore, to the memory of the monks, who, during the dark ages, preserved and handed down the designs and arts of architecture and gardening.

Light again dawned upon the world, with the art of printing, about the middle of the fifteenth century. The arts of peace and commerce prevailed; and these blessings again revived the long-dormant love of the fine arts, which prosperity alone can foster. The remains of ancient grandeur still further increased the desire to attain former magnificence; and Italy, during a long course of prosperity, set an example to the world, as the first of nations in intelligence and refinement. What political and social changes lost her this pre-eminence, it is not our purpose to inquire.

W. S.

WASHINGTON, D. C.

LETTERS:

IN THEIR PROPORTION AND SPACING.

ORDINARY observers, perhaps, would not ascertain any difference between the form and arrangement of the characters comprising the words whereby we express our thoughts, whether displayed in the "Letter Press" of books, the Lettering of Signs, or the "Plates" of Bank Notes and the National Currency. Yet these differences are very decided; and that which is a beauty in one case is a blemish in another. In printing, such letters as A, V, W, and Y, on account of the obliquity of their members, are spaced wider than other letters, from the necessarily square form of the types. In painting, the space between the adjoining oblique limbs of A and V, would be just the same as that between the upright limbs of I and M, &c., so that, in letters of exactly the same size in the same words, sign-painting is more condensed laterally than printing. Note plates for the same sizes and styles condense more than either, for the engravers not only use the sign-painter's spacing, but also run the minor limbs of letters into one another, without division, especially in the heavy shading; and this always with a good effect and often with a very happy one.

C. J. L.

MENSURATION OF SUPERFICIES.

Triangle	$\frac{\text{Base} \times \text{perpendicular.}}{2}$
“ equilateral	Square of any side $\times .433$
Trapezoid	$\frac{2 \text{ parallel sides} \times \text{perpendicular distance between them.}}{2}$
Parallelogram	Base \times perpendicular.
Trapezium	Diagonal \times by $\frac{1}{2}$ sum of perpendiculars.
Circle	Diameter ² $\times .7854$
“	$\frac{\text{Circumference} \times \text{radius.}}{2}$
Parabola	$\frac{2}{3}$ of base \times altitude.
Ellipse	Transverse axis \times conjugate axis $\times .7854$
Cylinder	Length \times diameter $\times 3\frac{1}{4}$.
Cone	Diameter of Base \times length of side $\times 1.5708$
Sphere	Diameter ² $\times 3.1416$

The circumference of every circle is 3.1416 times its diameter, or 6.2832 times its radius, or half diameter.

The circumference of an ellipse is that of a circle whose diameter is a mean between the two axes of the ellipse.

MENSURATION OF SOLIDS.

CUBICAL CONTENTS.

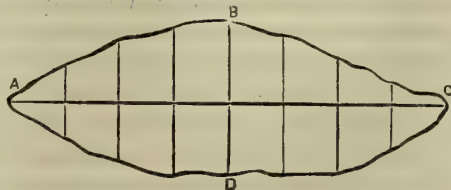
Prism	Area of base \times height.
Cylinder	Area of base \times height.
Sphere	Diameter ³ $\times .5236$
Cone	Base ² \times height $\times .2618$
Paraboloid	Diameter of base ² \times height $\times .3927$

To find the area of a triangle whose perpendicular is not known: Call the sides A, B, and C, and half their sum call S; then,

$$\text{Area} = \sqrt{S-a, S-b, S-c} \times S.$$

In land surveying or measuring, to find the area of a figure which is bounded by lines of irregular curvature, as A, B, C, D, in the accompanying figure:

The most convenient method is to draw the longest possible line (A, C) straight through the figure, and to divide it into equal parts, by transverse lines, as here; then add together the lengths of all these perpendiculars, or offsets, divide the sum by the number of offsets, and multiply by the whole length of the line A, C.



PROGRESS OF ARCHITECTURE IN THE UNITED STATES.

THERE is no more conclusive testimony of the state of civilization of a people, than that to be found in their Architecture.

The genius that flashes from Literature, or from Science, may be but the reiterated proof, that God has, in all ages, gifted individuals to dazzle their fellow-mortals, as meteors are sent to show that there is something still more brilliant, than that which the mind has been accustomed to view, even in the starry heavens.

Still, these emanations of monarch minds are but exceptional, at best, and are not to be taken as a prominent feature in the character of a nation.

Not so with Architecture. We behold in it the development of a people's intellectuality—the design, it is true, of one man—but, still elegancies collected from the many; and, as displayed, forming an integral part of monumental progress.

Should the Architect venture to erect something that does not meet the public taste—how soon, and how severely will the effort be decried! The poet may produce poor verses, meagre in every thing; yet the failure is not looked upon in the same light, for his abortive issue is still-born; and lives not to draw down the criticism of the future. A distortion in Architecture is, on the contrary, a monument of humiliation to stand up in judgment against the era that tolerated—rather than the Architect, who designed it.

How easily can we, in our day, discriminate between the different eras of civilization, through the vista of Architectural Styles. As, for instance, in the "dark ages," how palpable is the absence of that refined arrangement, which is born of a cultivated taste; and how distinctly do the deep shadows of

its demerits individualize the dark period to which it belongs.

Architecture is the Acropolis of Egyptian, Grecian and Roman greatness, without which traditional or written testimony, alone, would fail to keep their fame alive.

Were it not for the architectural remains of Central America, would Mr. Stevens ever have been able to discover, and convince the world, that a once mighty and polished people lived and flourished, where is now worse than desolation? The Aztec race have left the solid assurance of their power in the mighty specimens of the great Art of Building, which they placed, *in memoriam*, to sentinel their past.

From all this we, in our day—anxiously constructing a Republic which we fondly hope will be the greatest that time has ever yet known—should look well to the purity of the great Art, which is, perhaps, to chronicle our past magnificence, when other lands shall claim the sunshine of prosperity in their turn.

The birth of Architecture among ourselves may be said to be of recent date. He is not an old man who can vividly remember when what were classically termed the Grecian and Roman styles alone were the models by which our Architects undeviatingly designed. And one or two books were the sole monitors to guide the youthful aspirant to the honors of the "Square and Drawing Pen."

In those days Mr. Lefever was the leading spirit in "Modern Grecian." And, indeed, there are many remains of his peculiar genius to be found in our dwellings, which may still draw forth the award of approbation from the greatest lover of novelty. That there was grace in the ornamentation of many of the works alluded to, is undisputable.

But, that the Grecian architecture is at all adapted to the demands of Domestic Building, is very questionable. It had to be tortured into a compliance with the demands made upon it; and hence, in the hands of untutored, though, in other respects, skilful mechanics, it is not to be wondered at, that the classic styles became so plastic, as to be twisted into shapes and forms that were the old worthies of Greece and Rome—who prided themselves on conservative rule—to rise from their graves, it is not to be doubted, that they would, in the intensity of their indignation, hasten back to their dread abodes, as a welcome refuge from the fearful sight. The Greek and Roman styles held universal sway in city, town and village. The country was studded with “temples,” from court-houses down to bird-boxes. Every carpenter ploughed, tongued and grooved the antique into cornices with triglyphs, modules, consoles, and the like, until it came like a gamut to him; and was more musical, the more he used the scale. Outside barbarians, who wanted stylish houses built for themselves, had to put up with this style or that, or go without any, just as the Architects (?) of those primitive days decided. And, such was the Nubian darkness in which the free and independent citizens of this young Republic were then groping out a living, that every country carpenter styled himself *par excellence* an “Architect,” and

“— had his claim allow'd.”

But the “schoolmaster” just then set out to go “abroad,” and, invoking to his side A. J. DOWNING, a man peculiarly adapted to the work of reform, the unpretending but useful volume on cottages and villas appeared, giving to our country houses a more rural and less fane-like style of architecture. Every one may remember when those high-roofed and ornamented gable dwellings first came, as it were, like a blessing on the land—and every one

may also remember how the “old folks” squirmed at the innovation—and agreed with the carpenter architects that they were like “cocked hats.”

Despite the shrugs and grimaces of the conservatives, the reform went on. Downing soon had a host of able followers, who published illustrated volumes, in monthly parts, which were greedily bought up by the public, and at once produced their effect, in the impetus given to true taste, all over the land.

The deserted followers of Greek and Roman forms, seeing shrewdly where their interests pointed, laid BENJAMIN and LEFEVER on the topmost shelf, and owned that there was something in the new “fangle.” The progress of architectural taste became now very decided; and professional architects were sought after and well patronized. The stimulus had its due effect; and the appearance of our buildings, private and public, was decidedly improved. Street architecture was no longer the same monotonous repetition of stiff lines and unbending rules. The several buildings now put up assumed a variety, that gave to our cities a very pleasing appearance, as the observer's eye was continually courted by a fresh charm.

Our architects, in the full strength of their grown position, now borrowed largely from Europe; and, in consequence, the Italian and Romanesque styles began to be very general. The former, however, being best adapted to villas, was confined to the country, whilst the latter made free with our public buildings, such as railroad depots and churches.

The Byzantine, at length, was introduced. But this was rather too much for the public stomach to bear, and the lofty corbeled towers of brick had one great effect, at least, namely, to make those who were nervous still more so; and those whose nerves were strong, feel a something uncomfortable, they didn't know what, but it wasn't *pleasure*, at

the Byzantine pinnacles towering above them, apparently ready to topple down.

The Roman church was the great patron of this style—one as devoid of grace, stability, and all the other virtues of architecture, as could be found. The chief cause of the disgrace into which the pre-doomed Byzantine fell, in this country, was the venturesome ignorance of young and inexperienced architects rearing those giddy towers on insecure foundations; and the consequent lapsing of their work and their reputation into one wild, worthless heap.

Doubtless some church society, that has suffered, will bear me out in this "settlement" of the style Byzantine.

The Norman, or Anglo-Norman, rather, was likewise imported, per books; and soon showed its graceful segment heads in our buildings, the largest of which, the Smithsonian Institute, at Washington, though liable to the severities of artistic criticism, is yet an object of interest, if not for perfect purity of style, at least for a happy modulation of parts; and had it been built in a different location, on rising ground, might claim admiration as the tasteful residence of some shoddy baron, whose heart might be aptly cut, in alto, on the kindred stone shields.

The church has laid its hand on this style, also; and, indeed, some of the best specimens of Anglo-Norman, which have been executed in this country, are ecclesiastic buildings.

The Romanesque and Norman are sometimes confounded—on account of their mutual feature of semi-circular heads—not alone by the spectator, but by the pseudo-architect, whose lack of professional reading is apt to lead him into unintentional eccentricities. It is not an uncommon thing to see Saxon, Norman, and Romanesque jumbled up together, in one composition, without a question of purity, on the part of the brain, that gave the mass an existence.

Passing in review these styles of modern adaptation, we have not for-

gotten the claims of the Gothic. To it we are indeed indebted for many designs, that are well calculated to generate a feeling of warm respect, if not of actual love for the art, that could so intensify thought and transmute dull stone into poetic beauty. However inclined the taste may be to turn, from long experience of any style, as a relief, to some other, it does not seem possible that the Gothic can ever be laid aside. It is always fresh, from the very expansive nature of its characteristics, which may be said to be kaleidoscopic. For, there is no locality; no form of site, however intricate; no clime; for which this omnifarious style is not admirably fitted. Never under any restraint, nor losing its susceptibility of tasteful treatment; in fact, there is no other style in architecture which can be at all compared to it in general adaptability.

The lighter styles, such as the Venetian, French, and Swiss, have all had their introduction to this heaven of the emigrant, y'clept the United States; and we sometimes see the three triumphantly blended in an united state of their own, through the doubtless patriotic spirit of some unsophisticated designer, defiant of all received rules, but freighted with the single idea, that this is a land of freedom, where every man has an indisputable right to think and act as he pleases. But, in a state of things such as the present, we cannot restrain blockheadism by any means, save stringent criticism; and architecture is too young among us yet, to deal severely with its votaries, however senselessly they may act. Our business is charity—leave them to time.

No matter how faulty, through want of education, the great majority of our architects may be, yet, it must be allowed, that they keep utility in view, in all their adaptations; and seldom sacrifice comfort to mere show—as is so commonly the fault, with the majority of architects, in the more settled world. Neither is there such an insane desire,

on the part of our American community, for delving up long denounced absurdities in design, and re-vamping them, to create a sensation in the building world. No, our people would not tolerate the architect, who would try to impose upon them some of the unsightly nightmares of architecture that may be seen in London. It is true, that we have had foisted on us some of the lumbering conceptions of Lombardy; but they had a short day; and will never be repeated.

To the railroad companies is due much of the credit of advancing the interests of architecture, by the erection of depots in novel styles, many of them fine specimens of their class. The large hotels followed the lead of the railroads; and gave us, in different parts of the country, some stupendous, and really magnificent palaces of sojourn.

The Government, too, commenced, and carried to completion, several large city post-offices and custom-houses, almost all of which are in the same style and plan, as though unity of system were the point aimed at. This was an error on the part of the authorities, for here they had an admirable opportunity of disseminating a taste for various styles among a people whose opportunities of seeing really good examples are at least limited.

In the neighboring Dominion, the Government, at every town, presents the traveler with its two only specimens of architecture, namely, the court-house and the jail. Here, at home, the post-office, inevitably the same, meets the eye of the observer everywhere. And thus we cannot help seeing the great distinctive features of the two governments: the one affording every opportunity of enlarging the intelligence of its people—the other fully prepared to confine it.

The introduction of iron, into architectural construction, was another great impetus to improvement; and its effects were quickly discernible, in the tearing

down of numerous business buildings, and their re-erection, with all the display of ornamentation, which iron is capable of giving in the east. This great reform was visible in our leading thoroughfares, at our ferry landings, and everywhere that metal could be made available. Buildings were put up decorated with the five orders of architecture, as seen in the Colosseum at Rome; and every style—including the most highly enriched tit-bits of taste to be had in the voluptuous Renaissance—were lavishly displayed for our admiration.

The French Roof—or, as it is often called, the Mansard—was and is in great request. Public and private dwellings, and even stables, are covered, with this new roof; and no man, who wants a fashionable house, will be without it.

But the progress of architecture does not stop at external display. It is to be found in the interiors, also; and numerous and striking are the innovations on the comparative simplicity of the dwellings of yore. And here, let us understand, that in this indisputably “fast” country, “yore” means only a few years back on the track of time. For we have no “old houses,” that is, in the European acceptance of the term. The people of that venerable Continent would not wonder at a house dating its foundation back to the time when Christopher Columbus was a youngster, going to school. Here we look, with inquisitive “want-to-know” gaze, at the house in which General Washington held his “Headquarters,” some ninety years ago. How few are aware of the fact, that the oldest piece of architecture in this country was imported into New York, from Pompeii, by Mr. Delmonico, to serve as a marble porch, to adorn the entrance to his hotel, on the corner of Beaver street, in that city. Aye, there it is, somewhat more the worse for wear since its admission into our Union, than during the two thousand years of its previous retired existence.

Accompanying the progress of architecture, and ably assisting it on its onward march, was the discovery of illuminating gas; and to this may be added the rapidly increasing inventions of domestic comforts, wholly unknown to our benighted fathers, whose bliss was their ignorance; for, they sighed not after that which they never once dreamed of.

Wood, the frail material with which we have been constructing, is growing scarcer, and consequently dearer, giving way to sterner stuff to insure the duration of our buildings of to-day. This is all opportune, for we are coming by sure degrees to a style of "house-building" more in keeping with the characteristics of this country and this people, than those borrowed fossils of Europe, which, when they gave *appearance*, failed to give *comfort*; or *vice versa*. It is, then, most desirable, that we should have an enduring material, to make this style lasting; a thing to be handed down, from sire to son, through generations; a homestead, not alone for the present, but for the future.

Men are now giving more attention to the solids of construction, such as stone and iron, than they have hitherto done; and the knowledge of construction is beginning to be more thoroughly understood. It is a revealed and recognized fact, that ponderosity is not strength, but that strength is as much a manufactured article as any thing else.

It becomes, therefore, the duty of our generation of architects, to study the philosophy of this theory; and reduce it to practice; and not, like Sir JOHN VANBRUGH, be subject to the pungent epitaph which the sarcastic poet, POPE, proposed for the tomb of that then popular architect

"Lie heavy on him, earth—for he
Laid many a heavy pile on thee."

Next to construction, our architects have closely and clearly to study form and effect; bearing in mind, that they build permanently; and, therefore, the style of such building should be of en-

during taste. Positive beauty of outline is not a mere matter of inspiration or chance. It is a studied, well-digested thought—an embodied poetry of form, the test of which is the effect it produces on the observant eye.

It would repay many a modern architect to proceed more slowly with his design; and let every line have its share of thought, bearing in mind the collateral requirements of dimensions, distance, and apparent proportions, when these are fixed facts. For it is not by geometrical lines, to a scale on paper, that such things can be manifested.

Full many a building do we see around us, looking unsightly, which promised well on the drawing-board, nay, delighted all who saw it. Why is this? Because the subjects of light and shade have been overlooked, not in the mere coloring of the drawing, but in the actual construction itself, for there are many subtleties in atmospheric action, which cannot be studied in a drawing.

In fact, if we compare the design, with the building when complete, we will find a difference of effect, that will surprise the observer.

A perspective drawing is always taken from one fixed point. Not so the building itself. We view it from many different points; and this fact, added to the atmospheric effect, before alluded to, will give some elucidation of the problem.

All this goes to impress the necessity of deliberate study in the management of a design, with reference to a successful execution of it thereafter. Then there would be less complaining on the part of those immediately interested; and the architect would feel more satisfied with his completed building.

In all cases where taste is at all liable to be violated, by the overruling of their employers, it would be well, if our architects should unhesitatingly and determinedly set their faces against such interventions. No matter what the

consequence of opposition may be; better far lose one patron, than, by yielding to his whim, lose professional character. It is not on the owner that defects of taste are blamed, but on the one whose design it is, and who is alone accountable to public criticism for the discrepancies of his works.

Vanity expresses itself in stone, as distinctly and unmistakably as in words and actions. As a proof of this, it will only be necessary to look at the cut stone fronts of the first-class houses in our cities, aped by the second and third-classes. The house is, in reality, a brick building; but a paltry effort is made to falsify the truth, and make it appear stone, by means of a veneering of that material, cut in a showy manner. This lie is most generally apparent, from the fact, that part of the side-walls may be seen, either standing out before, or peering above other houses in the block.

Another bit of stupid deceit is too frequently practised, namely, the bestowal of the appearance of height, by the construction of a false pediment. Now, as a pediment is really intended to display the gable of the roof, this falsehood is the more criminal. This, too, is unmasked, by the projection above the next building, showing—to any one who thinks such a contemptible conceit worth an exposure—that it is stayed, by long sticks or iron bars, to the roof below it; an admirable mark for storms to play against.

All such *make-believes* are unworthy of a professional man; and should not be resorted to, under any circumstances.

Blank windows—although very properly denounced by Sir William Chambers, in his “Civil Architecture”—cannot, at all times, be avoided in street fronts. There is an excuse for their introduction; but they should be very sparingly applied.

The use of the bay-window has become very general; and even two-story bays are getting into vogue. They are

to be highly recommended, both as an addition to a room, and a pleasing feature on the exterior.

As regards interiors of dwellings, the height of story is something to be dwelt upon. For a narrow room, a high ceiling is unsightly; and, indeed, most of our parlors, in the best street houses, are too often sacrificed in width, for the sake of a large hall. They are, consequently, thrown out of proportion. Very high ceilings are a positive nuisance, for they involve the misery of being forced to toil up an endless flight of stairs. It is doubtful, then, wherein their advantage lies. But most people follow the lead in this, as in other fashions, for it is nothing more nor less than a mere fashion.

In the arrangements of kitchens and chambers, and their appurtenances, our architects lose no opportunity of giving elegance, convenience, and comfort in their plans; and to such an extent is this carried, that Europeans are surprised at the lordly state of our citizens' style of living. In fact, the architects of Europe do not approach ours in this respect. It is not mere display, but actual solid comfort, carried even to luxury. Nor are such houses viewed in the light of permanent family residences. Not at all, for, should the owner of any one of these get a desirable chance, he would not hesitate for an instant to sell it; and build another, with improvements.

Architecture must, of necessity, progress among a people so migratory as ours. Ever changing, ever new. The business locations of our cities are ever encroaching on the sphere of fashionable residents; and the latter, affrighted, are ever on the alert to fly to regions more remote from the vulgar ways of trade.

Thus it is with what, a short time ago, were palatial residences. The leaders of society have gone thence forever; the merchant and the boarding-house keeper have taken their places; and the archi-

tectural front, that once was the pride of its owner, would now be looked at by him with a feeling of surprise, to think how mean his ideas once were.

The public buildings, too, have a due share of this growing vanity, this inflation of wealth. Churches are not, by any means, exempt from it. On the contrary, they show a greater desire for display than their cotemporary civil buildings. The once much-admired old sanctuary, where many and many a weary pilgrim laid down, for a time, his worldly load of care and turned to GOD; and now, at last,

"Sleeps the sleep that knows no waking;"

where many a song of heavenly sound went up; and many a solemn prayer murmured through the vaulted nave—till the very walls and ceilings became baptized in blessedness—even this old abiding place of holy recollections is not exempt. Its day has gone by; its hoary clock-tower has ceased to intonate the notes of passing time; and its weary spire, that points to Heaven, seems to a younger and more thoughtless generation as an ever-lifted finger raised in reproof. Yes, it must come down. Trade has no feeling in common with its celestuality. It is out of place. Its children, to whom it was once so dear, have either removed to a new region, more fashionable now; or have left this life and sought their GOD. Nothing tarries but the cold tablets, that silently syllable the names of those whose dust lies there, without remembrance and alone. Anon, the new church rises; and lifts its pinnacled head in all the wealth of decorated architecture, sustained by massive buttresses, and pierced with many a flowered and mullioned casement, filled with glass, through which the light of day is led by gorgeously colored emblems, made to stimulate a flagging piety; and towers, baptisteries, cloisters, canopies are paneled and fretted over, until the wearied skill, that designed it all, can devise no more.

Every modern style is brought to bear on ecclesiastic architecture; and whatever religion has gained, certainly art has progressed in the movement.

The plain, square, rigid, Methodist meeting-house is a thing that was; and the florid church structure occupies its humble place. And this is as it should be. GOD delights to be honored by his children. Then why not dedicate to Him the glorious offerings of architectonic skill; and endow His house with richer ornamentation than our own? If Fashion must be led by Ambition, it is something that GOD has his share.

The secular buildings scarcely afford such a field, for our professional friends to try their pencils in, as that we have just reviewed. But, nevertheless, there is much to be done in its wide expanse. Much to be improved upon; and still more to be learned.

The system of "competition" in designing public buildings is one, concerning the advantage of which old Sir Roger De Coverly might safely observe, "Much might be said on both sides;" and that we, here, in the United States, have not yet adopted either side, might be said to be evidenced in the fact, that the calls for architects to compete are few and far between.

Reviewing those competitive displays, unbiased by the predetermined judgment of some persistent friend of one or other of the competitors, we look in vain for any thing to lead to the supposition that genius had any business there. On the contrary, we see an undue straining to meet the peculiar requisitions of the subject in hand; and as these requisitions are most generally too arbitrary, those who strictly adhere to them are sure to fail of satisfying either themselves or any one else. A positive injustice is done, too, in this matter of arbitrary rules, laid down for the strict guidance of competitors. As, for instance: All the competing plans, elevations, sections, and perspectives are required to be drawn to one scale and

to be finished in one tint. Now this is very fair indeed; for, it places all on an equal platform. But it should be enforced, or it is worse than unjust. It becomes a delusion, a cheat, and a snare.

The fact is, our architects, who design for such things, do it more with a view to carry off the prize by display, than otherwise. And it not unfrequently happens, that on testing those designs they are, in their most showy parts, found to be absolutely impracticable. As to *approximate estimates*, they are a mere humbug, to use a legitimate though vulgar term; and are trumped up to suit the occasion. Still, those very estimates are often the means of carrying off the prize for a certain inferior design.

And, while on this subject of designing public buildings, the thought naturally suggests itself: Why should our American architects so generally fly to the renaissance or any foreign style, devised originally to tickle the vanity of a king who gloried in being, in consequence, styled "The Magnificent?" Ours is a Government of a **PEOPLE**, and not of a *Prince*. Our public buildings should establish that fact, by the decision of character and unfrippery nobility displayed on their unquestionable elevations. What should the visitor to our country say, who had seen our Ministers, at foreign courts, dressed in the dignified plainness of republican apparel, if he beheld a flimsy copy of some part of the Tuilleries made to represent one of our Government buildings? Would not his ideas of our manly simplicity be somewhat changed by the sight? And yet, in competitions, as above, such efforts are actually exhibited. Let us hope that the good American sense of those whose office it is to judge in the matter, will reprove all such puerilities by a stern rejection.

Individuals, in the adornment of their dwellings, may use the same liberty that they can take in dressing their persons. Their folly or their taste is solely their own. Not so the buildings erected for

the Republic—such must not be allowed to misrepresent it.

Let architecture assume its true position among us, as the indication of our institutions, presenting always and everywhere one unmistakable front of rigid truth, under whatsoever guise of style. Let there be no meretricious ornamentation put on to create an effect of which we, as a sensible people, might be ashamed. And let all our architects understand this feeling.

It is a subject to be dwelt upon; and naturally leads to the question: Why is it, that comparatively barbarous nations have, in far less enlightened ages, invented a national style for themselves; and that our people—with all the impetus of inventive genius of a high order—should condescend to accept, or borrow one from abroad? The Moors were a people vastly inferior to our race; and yet we see the wonderful conceptions they left behind them.* Spain was overrun by them; and still, at this day, we can trace but little affinity between the Moorish and the Spanish styles of architecture. The latter avoided a slavish copy of their enemy's works, and struck out a path for themselves. The Romans borrowed ideas from Grecian models, but they established a complete and individual style of their own.

Why cannot we do the same? Why depend upon English, French, or German publications for all our ideas? It is unbecoming a country advancing so steadily in the front rank of nations as this is; and will one day be a subject of reproach.

That architecture may progress in a manner worthy of us, it is highly necessary that a knowledge of its rudiments should be acquired in our public schools. That such a science, coming so intimately home to our very firesides, should

* The Arabians were by far the most enlightened and scientific race of the ages referred to; and it was but natural that wonderful conceptions should abound wherever Saracenic influence had spread.—Eds.

be passed over unthought of in our studies, is something inexplicable. We pore over astronomy, geology, chemistry—in fact, every science but the one which we see looking upon us daily, as we pass through our streets, ready to admit its claims to admiration, yet wholly ignorant of what constitutes those claims.

Our citizens are fond of travel; and they go over to Europe and saunter up and down, viewing the architectural monuments of that great old world, and feel alternate awe and admiration take possession of their senses; but of the details of that wonderful art, which so enchains their attention, they know nothing. Of the history of its numerous styles, they could have read; but they thought the subject must be dry; and, therefore, they did not desire an acquaintance with it. Or, mayhap, pride had something to say in the matter; and hinted, that the subject was only fitted for mere mechanics. Be it as it may, certain it is, that a deplorable want of knowledge of this Mother of Arts exists even amongst our most learned men.

In England the Government fosters it, sustains it, and legislates for its advancement and protection. Professorships to teach it are established in the universities. There are manuals of its outlines in use in the schools. And no gentleman's education can be said to be complete, without at least a partial knowledge of it.

How is it with us? Our teachers, professors, and LL.D.'s are as utterly ignorant of it, as though it were a virtue to be so. No primer, no book, no chart, no guide whatever is to be found, that may tend to open a passage through which one solitary ray of light may penetrate the mental darkness.

If we really mean to make this nation what it ought to be, it is time that we should examine into the merits of this matter. It is impossible properly to patronize architecture, if we do not do so understandingly. For blind patron-

age is dangerous at best: and may lead to the establishment of many faulty constructions, whose defects are too permanent to be easily corrected.

Let us hope to see, not alone classes of design established by our State governments, but teachers and hand-books in every common school, and sound professorships in every college, so that the advantage of this neglected branch of learning may not be confined to those who wish to make a livelihood out of it; but be laid open to all, as a science to which man owes his first shelter and his present grandeur.

Then, indeed, may we expect to see genuine ARCHITECTS take the place of those puny peddlers of European genius, whose shrewd business tact enables them to assume the name, that Nature never intended to endow them with.

There are public buildings, now being erected in our largest cities, so disfigured with faults of style, that it is painful to the discerning eye to look upon them. But they have cost millions; and will continue to cost, until they are finished. Were a knowledge of architecture more general among our citizens, such a criminal outlay of the public money, for such a barbarous pile of blunders, would be sure to raise a cry for justice to be denounced upon the heads of those whose fault it is.

But the press is silent; and the people do not understand. Why should the press be silent? Why is not architecture, that is permanent, as worthy of close criticism as music, which is, at best, but evanescent? The answer is—that there are few, if any, of the "gentlemen of the press" who are able to venture a criticism on the subject. This should not be so; and yet so it is. If a building is about to be erected, and a newspaper desires to give a description of the intended structure, the architect's office is the place where the affair is concocted; and, most generally, the article goes into type, just as it comes from the architect's pen. But whether

it gives a fair, unbiased idea of the intended structure, cannot be discovered, until the masonry itself stands up, to testify.

If a painting is the subject to be treated of, our journalists have the whole matter well in hand. They are hypercritical on its drawing, its coloring, its *chiar oscuro*, its effects and its defects. They can tell which of the ancient masters it is, by the peculiarity of the touch. But, why should not architecture, the greatest of the Fine Arts, be at least as liberally recognized?

No, let the public have sound instruction, so that they can, at a glance, discern between pretentious quackery and genuine effort. This is the only sure way to aid the progress of architecture. Educate the eye; and you at once establish taste, governed by judgment, and supervised by discretion and truth.

Let only competent practical men sit on building committees; and let their decisions be bound by an oath, as that of any other jury. This latter requirement will be found more reasonable to all, when we consider that on their decision rests the raising and perpetuating of a monument to our credit, or our shame.

Of all things, let it be distinctly understood, that political bias shall have no hand in the appointment of an architect, or the choice of a design, for any public building whatever. Merit should be the only test of qualification; and should always insure its possessor against the intrigues of those whose political status is their sole recommendation. Public works, such as national buildings, should not be confined to the brains of a Bureau at Washington, no matter how apparently economical such an office may be, in the eyes of the government. Individual talent throughout the land should have an opportunity of exercising outside skill on such works; and we all know, that free growth of any thing is superior to the same, when confined. So

it is with brain; the free, untrammelled genius loves to display itself; while that which is under special control, and subjected to certain rules of office, is troubled with a sickly sameness, and a want of that energetic fire so necessary to its true development.

Every possible means by which the progress of architecture may be aided and abetted, should be resorted to for the sake of its own intrinsic worth, as well as the national spirit it builds up before mankind.

The delicate taste, and natural love, for all that is refined and beautiful in art, would lead the women of our country to study and delight in architecture. Why should they be debarred that privilege? There is no reason why they who seek philosophy as a study, should slight this. It is an art, so consonant with the most elevated feelings of their nature, that they must love it and cherish it above all others; for, it is founded on TRUTH, and makes GRACE and UNITY palpable to the world, as a model from which to study what life might be, were we but intent to make it so.

Why are our clergy not students and eminent promoters of architecture? The GREAT ARCHITECT of the mighty Universe, who canopied this world of ours with that cerulean dome which palsies human skill, and leaves the rapt imagination in eternal bewilderment, has shown His interest in architecture, and condescended to dictate in its workings. HE to whom the fullest extent of human skill is dedicated in the glorious temples erected to His glory—shall his ministers be ignorant of the favored art? It remains for themselves to say. This will suggest, that many a noble theme, most applicable to man's career and object, might be chosen from the details of architecture, and be brought to bear with impressive force on the minds of both preacher and parishioner, whilst their eyes rested on the solid example before them. The clear-sighted Shake-

speare saw and pronounced the fact, that there are

"— Sermons in stones."

Yes, and eloquent sermons, too; especially when those stones, symmetrically congregated, do honor to the Great Jehovah!

The intimate history of Christianity is interwoven with that of architecture, for ecclesiastical takes the precedence of domestic forms; and the progress of the great crusade is to be found indicated by the temples erected on its path, down to our own day. They took the place of the altars of paganism. And what is more interesting than a sight of even the foundation-stone of one of these? Yes, ecclesiastical architecture, for the past eighteen hundred and sixty-six years, is, indeed, a study of intense interest. Taking at once a nobler and more spiritual form than that devoted to heathenism, the Christian Church courted that light of day which the heathen temple shunned; and raised its spires, like imploring hands, to Heaven, to send down that peace of soul the heathen never knew.

The architect of to-day is but the pioneer of one more masterly, because better educated, leading the destinies of a great art, whose claims on the attention of our age are as yet barely recog-

nized. However, he can, even to-day, make himself felt and understood in the future, if he will simply do his duty to the mighty mistress he serves.

Money-making is no element of art. True genius may be liberally sustained; but it cannot be bought: it is unpurchasable. He that sells the honor of his art, sells his birthright; and buys the contempt of all honest men.

Steadiness of purpose should be the guiding principle of the architect. Studying well the objects to be attained in the course of his design, he must not falter from that course; but be true to his art, ever and always.

Originality is, of all things, the most desirable; and, in this new, this bride-like nationality, there is no necessity for fettering the imagination with the architectic dicta of another Continent. Then let the American architect, in all professional things be independent—free in action as in thought.

To copy is servile; and argues a mind unequal to the task of thought. Why should one copy? He, who has so glorious a field before him? Let him study out carefully the beauties and the faults of the past ages of his venerable profession; and give his mind to the inspiration of untrammelled thought, counseled by the choicest breathings of the beautiful and the sublime.

THE PHONOPHORUS, OR CONDUCTOR OF SOUND,

Is one of the important inventions of the day. It is well known that sound is transmitted better and faster along solid substances than in the open air. It is quite as well understood, that tubes concentrate and carry sound with great facility and distinctness; and the ordinary speaking-tube, in commercial and manufacturing establishments, is familiar to many thousands. The Phonophorus depends upon the general principle of the speaking-tube; and can be applied very readily to churches, lecture-rooms, private dwellings, and business places. We know of churches, wherein this instrument is applied to forming an easy transmission of sound from the pulpit to the pews of members afflicted with deafness, situated in different parts of the building, so successfully, that the slightest whisper uttered in the desk is instantly audible in the pews, many feet off, connected with it, although not perceptible, anywhere around, a very short distance from these several pews.

We are practically familiar with the effect and efficacy of this instrument and can personally recommend it. It has been lately introduced in a number of public edifices in Philadelphia; and we should think the custodians of others would be glad to hear of it. The agent for this city is Mr. Samuel K. Smith.

SLOAN'S ARCHITECTURAL REVIEW AND BUILDERS' JOURNAL.

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MONTHLY REVIEW.

THE CATHEDRAL OF MILAN:

EXTERIOR.

AS our October essay, upon the Origin of the Gothic Style, had direct reference to this celebrated fane, a short description will not be amiss.

Near the centre of that portion of Upper Italy, whence springs the peninsula composing the chief expanse of the entire country, yet well inside the main body of the continent,—some seventy-five miles north by east of Genoa, and about forty south, a trifle west, of the fork of the Lake of Como, that inverted letter Y, whose arms seem stretching out lovingly, as if to embrace, although they come not near it,—in the same general latitude, say $45^{\circ} 30'$ north, with Verona, Padua and sea-washed Venezia—forming almost an equilateral triangle, of eighteen miles base, with the famous battle-fields of Pavia and Lodi—to the west, within easy spy-glass of Mont Blanc; and with the outliers of the Pennine, the Lepontine and the Rætian Alps, in full view, on the northern sweep of the horizon,—upon a beautiful and fertile plain, between, though not neighboring, the rivers Adda and Ticino, which supply its canals, but directly

upon the Olona,—stands the book-mart and third city of Italy, very ancient, yet ever youthful MILAN.—Milan,—which, —founded by the Insubrian Gauls, B. C. 400, inhabited and embellished by many of the Roman Emperors, graced by the student life of Virgil, second only to Rome in population and extent,—sacked by Attila, A. D. 452, in the invasion which caused the rise of Venice,—taken in 1162, and, through the jealousies of the surrounding cities, utterly razed by Frederick I. of Germany, with the exception of the Basilica of Sant' Ambrogio,* and a few other churches, that alone marked its site among the ruins, its inhabitants being dispersed in four surrounding villages,—refilled, with all the survivors, and restored, in 1167, after the great Lombard League, by the very places, which counseled its destruction, imperial, royal, republican, royal, again

* This Church contains two small panels, one at the top of each of the folding doors, shown as part of the gates, which St. Ambrose closed against the Emperor Theodosius after his merciless slaughter of the Thessalonians. The remarkable event itself took place at the gate of the *Basilica Portiana*, now the church of *San Vittore al Corpo*.

republican and royal again, and, we hope, once more and forever to be free, —whether in her beauteous self, her noble edifices, or her famous children,* — whether furnishing the world with warriors' panoply or ladies' fashions,— has ever been magnificent, influential and renowned. Well towards its very centre, in the midst of the *Piazza di Duomo*, with immediately on the north the *Corso Francesco*, and on the south the Imperial Palace, towers *Il Duomo di Milano*,

THE CATHEDRAL OF MILAN.

This temple is one of the most marvelous and intensely interesting structures of the world, whether considered in regard to its architects, its clergy, its foundation, its history, its vastness, its beauty, its treasures, its subterranean places of worship—the Winter Church and the Borromean Chapel, its centuries-prolonged course of construction, or its having been the means of transmitting to us, from the Middle Ages, the true PROPORTIONS OF POINTED ARCHITECTURE—popularly to be forever known as GOTHIC—as derived from the Church of the Holy Sepulchre at Jerusalem.

This article, though apparently somewhat extended, is yet, with respect to Milan Cathedral, little more than a *catalogue raisonné* of remarkable points, so condensed, that it scarcely varies from the compendious details heretofore published in a number of consulted authorities, treating of this pile and its neighborhood; and the general correctness of which is confirmed by the vivid recollection of our senior editor, who has himself seen the reality, which is not, and cannot well be overdrawn. Yet, in all its slenderness of mere description, the account—from a subtle influence upon the imagination—actually has the

effectiveness of a romance. And though familiar enough to some of our readers, to most it will be as engaging as it is new.

As is not unusual in the case of important structures, the present fane is certainly the third, perhaps the fourth, re-edification of that original one, mentioned by St. Ambrose, in a letter to his sister Marcellina, as “the great new Basilica.” The earliest was destroyed by Attila. Rebuilt, it was accidentally burned, in 1075; and again destroyed by Frederick Barbarossa in 1162. This demolition, however, was, it is claimed, only partial, arising from the fall upon the church of a lofty bell-tower, destroyed to preclude its employment as a fortress.

The corner stone of the pile, as now existing, was laid by GIAN' GALEAZZO VISCONTI, in 1387. The undertaking is variously ascribed to the fulfilment of a vow, and the wish to encourage the arts. The Duke, seeking an architect beyond the Alps, applied to the Free Masons of Germany; and Italian Patriotism has vainly sought to disparage the claims of HEINRICH ARLER OF GMUNDEN, or *Enrico di Gamodia*, as the people of “*Welschland*” * euphonize it. With him, between the years 1388 and 1399, were associated other brethren from Germany, Paris, Normandy, Fribourg, Ulm and Bruges. Some Italians were afterwards called in, among others the celebrated *Brunelleschi* of Florence. Germany, however, still continued to be special mother of the architects of the cathedral, for, as late as 1486, GIAN' GALEAZZO SFORZA wrote to the magistrates of Strasburg, desiring them to send him *Hammerer*, the master mason of their *Domkirche*, to advise upon some difficulties apprehended in the construction of the central tower.

The erection, frequently interrupted, and, when, resumed, often carried on slowly, is yet unfinished in some of the

* Such as Popes Alexander II., Urban III., Celestine IV., Pius IV., and Gregory XIV., Alciato, the jurist; Cardan, the geometer; Beccaria, the celebrated author of “*Crimes and Punishments*,” and Alessandro Manzoni, the first living novelist of Italy.

* *Teutonice* for Italy.

details. The *Omodei*, father and son, vaulted the octagon cupola, from 1490 to 1522. On the extinction of the *Sforza* dynasty, the three western divisions, or arches, of the nave were left unfinished; and not completed till 1685. The central tower and its terminating spire were finished in 1772, from the designs of *Croce*; and the gable and upper range of windows of the front, along with many of the buttresses and pinnacles by *Amati Zanotta*, and others, between 1806, when NAPOLEON BONAPARTE ordered the work to be resumed, and the present hour. The dates just given involve only some of the principal constructions; *but the scaffolds have always been standing, on some part of the building, ever since the first stone was laid.*

It appears, that the original designs for the façade had long been lost; and the nave, as erected, lacked three of its arches, or one-third of its length. At the then temporary termination, the western or principal front was supplied by a façade of black and white marble, built, as indicated above, far within the line of the full and present structure; and, as far as raised, unfinished and inelegant. In 1560 SAN CARLO BORROMEO, to complete the front, employed *Pellegrini*, who designed, upon a magnificent scale, an Italian façade. San Carlo died; *Pellegrini* was summoned to Spain by Philip II to paint the Escorial; and the work was very leisurely carried on by others, amongst whom were *Castelli* and *Francesco Ricchino*, who, altering the designs of *Pellegrini*, gave the Roman doors and windows that exuberance of ornament, which they now exhibit; but the plans of the latter—according to one of which, the front was to be composed of a gigantic Roman Portico—gave rise to numerous discussions, resumed and continued during the 17th and 18th centuries, wherein some of the architects of Lombardy very strongly and very properly protested against the incongruous admixture of the Roman manner begun by *Pellegrini*;

and strenuously advocated the reconstruction of the façade in the Gothic style.

Pursuing this general idea, in 1635, two Gothic designs were proposed by *Carlo Buzzi*, and a third by *Francesco Castelli*, all three of considerable merit. Time passed, and the affair slumbered; but in 1790, the syndics finally determined to Gothicize the façade, preserving, however, the doors and windows of *Pellegrini* and *Ricchino*, on account of their elaborate elegance; and, by way of apology for this discrepancy, they caused an inscription, stating this reason, to be engraved upon the corner buttress of the front.

To these works Napoleon gave great impulse; and their continuation was intrusted to a commission, under whom the façade was brought to its present form, chiefly by the insertion of three pointed windows, thus harmonizing the lines of the gable; and the greater number of the pinnacles and flying-buttresses of the remainder of the edifice were completed.

The cost of these undertakings, under the French government, was about three and a half million francs, one and a half million whereof were derived from the sale of the lands belonging to the Duomo; and the remainder from the proceeds of the property of the suppressed monastic institutions. After the revolution of 1848, the supplies were temporarily cut off; yet considerable was done during the subsequent Austrian regime.

The *Marquis Cagnola* projected a magnificent Gothic campanile; and others proposed flanking the front with belfry towers. The designs for the latter were sent to Napoleon at Moscow, and lost in the calamitous Russian campaign.

At present, nothing further is in progress in this part of the pile; but, when *Amati* inserted the Gothic windows, he supported them by "bearing arches;" so, that, if hereafter found expedient to remove the Romanized doors and windows, the operation may be performed without injury to the superstructure.

When Gian' Galeazzo endowed the Duomo, he included in his donations the marble quarries of *La Gandoglia* on the Simplon road, beyond the Lago Maggiore, and of the product of these quarries the building is entirely constructed. Time gives to this marble a fine warm yellow tint.

In addition to Heinrich Ahrlar, architect-projector, a multitude of architects, of more or less note, devoted their time and genius, or talents, varying with the man, to this glorious pile. The masonic brethren of "*Gamodia*," Hammerer, Brunelleschi, Simone de Ursinigo, Bramante, Bramantino, Cæsare Cæsariano, Vincenzo Sevegno, Guiseppe Meda, Angelo Siciliani, Galeazzo Perugini, Pellegrino Pellegrini, Martin Basso, Gabrio Busea, Melchiotte Megliavacca, Domenico Lonati, Gio. Maria Olgiati, Giacomo Soldati, Fabio Mangoni, Carlo Buzzi, Girolamo Quadro, and others. With all his genius and aspiration, when the corner-stone was laid, Ahrlar—far better fated than he of Cologne Cathedral—must have thought pensively of the far distant completion that himself could never hope to see. Yet much less alteration of design has occurred here than five hundred years, or fifteen human generations, would warrant; and, if, happily, and happily, in the years to come, the west front shall be re-erected, in grand, pointed fashion, the spirit of the master-architect, already gratified beyond most human hope, can contemplate this resplendent and resounding Gothic anthem with the most ineffable delight.

"This cathedral is remarkable for the extreme lightness of its construction. Around the roof and sides are 4600 niches, most of which are already occupied by statues, as the remainder will be. The building is also adorned with more than a hundred beautiful spires, giving the exterior the appearance of a forest of marble. In the interior every thing is of the most imposing and gorgeous description, and the eye wanders almost overpowered by the multitude

of elegant and grand objects claiming attention. The floor is formed of marble of different colors, disposed in various patterns; paintings by the most celebrated masters adorn the walls; and the groups of figures presented by the resplendent windows are of a size and boldness probably unequaled in the world."

The principal dimensions of the cathedral, omitting fractions, are as follows:

	English feet.
Extreme length	486
Breadth of the body	252
Between the transept ends	288
Width of the nave, from centre to centre of the columns, which is double the width of the aisles, measured in the same way . .	63
Height of the crown of the vaulting, in the nave, from the pavement	153
Height from the pavement to the top of the statue of the Madonna, which crowns the spire . .	355

Just beyond the entrance, the pavement, which is a mosaic of red, blue and white marble, is marked by a meridian line laid down by the astronomers of Brera in 1786. The sun's rays, passing through a small aperture in the roof, cross it, of course, at high noon.

The ground-plan of the Duomo is a Latin Cross, terminated by an apse, or tribune, in the form of five sides of an octagon. The body is divided into a nave and four aisles, by four ranges of colossal clustered pillars, with nine intercolumniations. The transepts and the chancel end are divided into three aisles. There is no triforium gallery, nor any division corresponding with it. The vaultings of the roof spring directly from the pillars, whence arises an appearance of great loftiness. Fifty-two pillars, each formed by a cluster of eight shafts, support the pointed arches on which rests the roof. The total height of each pillar of the nave and chancel is eighty feet. The diameter of the shaft

is 8 ft. $3\frac{1}{2}$ in. The diameter of the four great pillars, which support the octagonal cupola, is one-fifth greater.

The beautiful capitals of the nave and choir were designed by *Filippino of Modena* in 1500. The lower part is formed by a wreath of foliage, mixed with figures of children and animals. Above is a circle of eight niches, corresponding to the intervals between the eight shafts of the clustered pillar, and each containing a statue covered by a canopy. The shafts, which divide the niches, terminate in a pinnacle, surmounted by a small statue. The design, however, is varied in different pillars. The roof is painted to represent an elaborate fret-work. The execution is modern; but the design, as well as this mode of ornament, is ancient. The five door ways on the inside were designed by *Fabio Mangoni*, in 1548.

Flanking the great centre doorway are two granite columns, each of a single block. They were given by San Carlo, and brought from the quarries of Bavono. They have been called the largest monoliths in Europe; and probably were so, until the erection of the church of St. Isaac at Petersburg. The height of each shaft is 35 feet, the diameter 3 feet $10\frac{3}{4}$ inches, and the cost of quarrying and finishing them amounted to £1948.

A tunnel connects the Duomo with the Archiepiscopal Palace. Annexed to it is a workshop belonging to the fabric, in which is the wreck of the model of one of the plans for completing the front of the Cathedral. Though sadly broken and neglected, it is so large, that a man can stand up in it. According to this design, the front would have had a superb portal of Gothic arches, not unlike Peterborough Cathedral in England, and much more appropriate than the present façade.

The west façade, or main front, exhibits—for pointed architecture—a great deal of horizontalism, in its panels and canopies, along with much perpendicularity on its lower buttresses, both prob-

ably designed to harmonize with the Romanesque style of the doorways and lower windows, the former of which, very beautiful in themselves, have segment pediments, and the latter obtuse angled ones, the whole “broken” at the base.

“In the tracery there is an unusual approximation to the *flamboyant* style, probably owing to the influence of the French Gothic, as it is most apparent in the great east window,* built by Campana from the designs of Nicholas Bonaventure of Paris, 1391.”—[Murray.]

In the west front, the tracery of the centre Gothic window is partly geometrical and partly flamboyant, the head being composed of two concentric circles, the outer filling the arch head, the small inner one containing a quatrefoil arranged as an ordinary square cross. Between these two circles are five radial volutes thrown from the centre, marked by the quatrefoil, towards the circumference; the two outer windows have the large circle of tracery divided geometrically. Each window is in three great divisions running up, midway, into straight acute-angled sub-heads, kept upon the same horizontal line for each, and filled in with lozenges—the work advanced, screen fashion, with crockets and finials—and, above, in curved lancet sub-heads running up to the larger circles, so that in each case the side divisions are taller than the centre ones. All these windows are deeply recessed, and have in their jambs supporting brackets, with canopied statues. The external angles of these concave jambs have the “egg and dot” moulding; and each of these three Gothic windows rises from a pro-

* We do not find it so particularly apparent here, as might be inferred from the paragraph cited. The window in question is equally balanced between the geometrical tracery and the flowing. The central compartment, however, is a circle filled with eight, wavy, scrolled rays issuing from its very centre, and finally *curving*, but not *melting*, into its circumference. The open spaces between these rays are not cusped; and altogether, while this compartment is not geometrical, it certainly is not flamboyant in the true sense of the term, but, in fact, must be considered unique and rather un-Gothic, although the lines are flowing. Yet, as *not geometrical*, this might warrant the opinion in the text.—Eds.

jecting Roman base, with Romo-Gothic exterior supporting brackets. Notwithstanding the commingling of unallied forms, the general effect is by no means bad; but there is a want of those overpoweringly grand features naturally belonging to the face of a mighty edifice; and all its grace and beauty ill compensate for the lack of a lofty, deeply recessed and highly embellished Gothic portal, dominated by a far loftier pointed window, with artistically flowing tracery, and at least tenfold the comparative size of any in this front.

It is one peculiarity of this church, that—along with the mixture of geometrical and flamboyant tracery, both in the same windows, and in separate ones,—with the exception of the main transept windows, the flamboyant, which, in other edifices, is mostly reserved for the exhibition of art and skill in the chief features, here, in its best manifestations, constantly occurs in rather subordinate positions. Of the three great windows in the tribune, all of the same size, the centre one is the more geometric—having, inside the governing circle, a square cross of five circles, the centre, larger one, being fashioned of eight wavy scrolls, the top and bottom circles having quatrefoils, *à la St. George's Cross*, and the side ones with their quatrefoils treated *saltire-wise*, or as *St. Andrew's Cross*. The windows on either side, on the contrary, have each a central open octofoil, whence volute-wise radiate eight large whorls, with their stems inward, reflexed into as many small ones, with their stems outward—all bounded by a single line, and best popularly represented by two of those figures called by the ladies—in describing shawls or dress patterns—"palms," adjoining one another and laid "in and out" or "stem to leaf," the eight pairs completing the circuit. The main transept windows have these eight larger and eight smaller whorls—all bounded by one single flowing line, as before—arranged similarly in the great circle—though emanating

from circled-trefoil-centre circles with the single leaf uppermost—save that the whorls here most resemble heraldic *guttæ* or drops, and correspond with straight radii.

As the perpendicular divisions of the windows all terminate in lancets underneath the dominating circles, of course the outer ones are higher than those in the middle. These are arranged in twins, the two outmost pairs with acute crocketed and finialed sub-heads, the inmost pair without; and the heads of all which are filled with acute trefoils, the single point uppermost.

The upper angles of all the windows are filled in, above the predominant circles, either with simple trefoils, or circles with inscribed trefoils,—all single points upward—flanked with cusped "palms," or leaves, points outward and downward; and throughout all is a world of minor tracery, quite unprofitable to particularize, in so general a view, but exceedingly rich in effect.

The exterior of the minster throughout is divided into many slender vertical compartments by cluster mouldings, ramifying into cusped, crocketed and finialed straight-angled heads, passing through a horizontal string-course and finally terminating in straight lancets, elaborated and filled in with cusped semi-circles, surrounded by acute trefoils, and with the usual accompaniment of crockets and finials.

The very elaborate flying-buttresses, provided with slender vertical piers midway, are finished beneath with oblique tri-cusped arcs, the centre cusps having pendant trefoils. This portion of the cathedral—immediately over the outer aisles of the nave, and itself, by the upright middle supports of the flying-buttresses, just glanced at, divided into two twin-adjoining and ever communicating aisles, open to the sky; and forming a splendid promenade on either flank,—has thousands of multi-foils, crockets and finials, each of a dif-

ferent pattern, so that the grand general walk, from its apt resemblance, is, in Milan, termed "The Flower Garden."

All the buttresses and tower-buttresses run up into spires, sometimes single, at others clustered, each spire terminating in a statue, instead of a foliated finial.

This, as a general characteristic, is entirely unparalleled, in artistic Gothic, although actually pioneered by the Baptistery of Pisa, built in 1060. The effect is both charming and superb—with an enormous addition to the cost, which, even with floral finials, must always be very great. The statue of the Virgin, which surmounts, at once, the lantern spire and the tabernacle itself, is eighteen feet in height.

The main tower is finished in two concave sweeps, grandly carrying the sight upwards to the observatory and the very pinnacle.

Although the Gothic of this superb edifice is certainly unique, it is unmixed, except, as before detailed, in the western front.

The east end, or tribune, is probably the most ancient, or the original, portion of this minster.

It is calculated that the niches and pinnacles of the exterior will require a *population* of about 4500 statues. Of these more than 3000 are executed, and in place, besides the bas reliefs. The excellent sculptures of the central door, by Bono, Castelli, and Vismara, about 1635, may be especially pointed out.

The interior of this magnificent place of worship is as gorgeous and rich as the exterior is elegant and chaste. Its reality, simply told, might so exalt a master imagination, as to disappoint it, in the ultimate visiting; but the imagination would require to be very superior, indeed, to soar beyond the plain reality. The attentive reader will not find us tedious in quitting the outside and devoting a few pages to the inside of the shrine.

It is as well, perhaps, here, to remark, that papers of this description are not

designed for architects, already, as a class, well read in all such matters; but to cultivate a taste for professional essays among our general readers, who need lighter food as a provocative to the more solid architectonic feast. Our pages, be it remembered, are always open to the masters of the profession, wishing to address their younger brethren in either general or special articles. Meanwhile, these will pardon us for not always addressing themselves, but, occasionally, those, not only not educated to the point of criticism, but hardly in the rudiments.

Not as a perfect edifice of its style, by any means, do we consider the Cathedral of Milan. We have already pointed out the faults of the main or west front; and there is an equally serious defect, as to the general proportion, in the comparative lowness and absence of gradual taper, in the mass of the central tower: but, estimated as an entirety, it is the conception of great genius, adequately embodied throughout. As a model, it would be very defective; but, as a fact, it is very effective.

John Henry Parker objects to the material, saying, "The Cathedral of Milan is veneered with white marble, and, although, from its great extent, the effect on the whole is very magnificent, yet, in point of style, it is undoubtedly very bad; the open, pierced parapet, standing out against the sky, has the appearance of being cut out of card-board." Yet it must be understood, that this marble is, in reality, not crystalline carbonate of lime, but a very compact limestone, which does not admit of a high polish.

The proportions of many fine buildings are completely obscured, in most points of view, by crowded, low or petty surroundings. With true prescience, in its projector, the site allotted for the Duomo is quite commensurate, in its extent and associations, with the consecrated dignity and lofty port of the glorious edifice it upbears.

DESCRIPTIONS.

METROPOLITAN SAVINGS BANK.

THE wonderful advance of this great Nation, in wealth and taste, is nowhere more evident, than in the constantly improving appearance of the street architecture of our cities; and this growing desire for embellishment is so evidently popular, that those keensighted men, who have the handling of our monetary affairs, deem it a safe investment to build up palatial structures, which, while they tend to give character to the institution, likewise add a material grace to the architectural appearance of our public highways.

Of late, we have had several highly creditable specimens of the taste of our professional brethren in this line, the chief of which we will review from time to time. In our present number, we give an illustration of one, recently completed, from the designs, and under the superintendence, of our friend and former pupil, CARL PFEIFFER, Esq., Architect, New York city.

At a glance, this elegant design can be recognized, as emanating from the great Metropolis of the Union, where wealth stimulates enterprise; and successful enterprise, again, begets wealth, which is not slow to display its presence, in the ornate beauties of architecture, which everywhere delight the eye.

And not alone is the effect of admiration produced by these beautiful architectural features. It is, also, called forth, by that natural pride, which every true American takes in the unmistakable progressiveness of his country, here presenting itself in the accumulating gains of even the humblest class of society, to whom, conjointly, these

Savings Banks may be truthfully said to belong.

That such an investment of savings is judicious, there cannot be a doubt, when we look at the simple fact that city real estate is rendered valuable, in proportion to the amount of improvement put upon it; and, that the improvement is to be valued, in a great measure, by the appearance it is made to present. Hence the necessity, for, not alone, an outlay of capital, but for the production of taste, in securing, for the real estate in question, the value desired, through the instrumentality of just such designs as that which Mr. Pfeiffer has so ably conceived, and so thoroughly constructed.

The architectural grandeur of her edifices is truly a just motive of pride in our great sister city of New York; and a pride that will not fail; for, as edifice after edifice rises in her midst, its presence suggests still more improvement, prompting the growth of taste, and stimulating the desire to push on the banner of empire, ever to the front, that the eyes of all may continue to see, and to acknowledge, the fame-emblazoned title "Excelsior."

In the other cities of our Nation, as in New York, this embellishment of wealth must become an imperative duty; and the talents of our countrymen be quite profitably employed in architecture. The constantly presented lessons of design will then arouse the still more active attention and sympathy of our people, until every eye is keenly educated, and every designer must run the gauntlet of public opinion.



OFFICE OF THE METROPOLITAN SAVINGS FUND, NEW YORK.

That such a progress of improvement is actually now in existence, can be seen in the great changes, which architecture has undergone, since the revival of the Palladian Style, the reproduction of which has cut loose the bonds of Greek and Roman control, and left the imagination to range, unfettered and free, over the expansive field of art; to cull the varied flowers, that spring to the hand, as heaven-born offerings, for the genius of man to blend with the lines of beauty, which rise in the richness of pure design; and gratify the craving spirit of Taste, that urges every mind to see, to think, to learn.

We do not mean to be invidious, in introducing Mr. Pfeiffer's work, in the present number. On the contrary, it is our desire to present the claims of all our professional brethren, who may think proper to favor us, as he has so kindly done, with illustration and description of their productions. There shall be no favor shown to any; and we shall be influenced by none.

THE METROPOLITAN SAVINGS BANK BUILDING is on the N. E. corner of Third avenue and Seventh street, opposite to the Cooper Institute. There could not be a more favorable site than it occupies. The Bowery, at this point, is very broad, as the Third and Fourth avenues begin here; and the front of the Cooper Institute occupies the middle ground.

The Front and the Side, as shown in the illustration, have an uninterrupted display, and certainly the architect has done credit to the position he controlled.

The Front is forty-four (44) feet in width, and the depth of the edifice is seventy-five (75) feet. The whole is seventy-five (75) feet in height, from the street level, divided into four lofty stories. And besides these there is a very fine Basement—giving an actual height of ninety feet from the Basement floor to the top of the roof.

The walls are massive; and well built.

The Front and exposed side being of selected White Marble.

The Style is *Franco-Italian*; and is in unexceptional keeping, throughout. Each story is divided from the other, either by a dentiled or corbeled belt-course; and the walls are surmounted by a chaste modillioned cornice, resting on a dentiled bed.

From this cornice, rises, in a graceful curve, the lofty Mansard Roof, with its simple cornice, crowned by a florid iron fence, with highly enriched spear-head supporters. The Mansard is covered with ornamental cut-slate; and is much set off by the effective dormer-windows, which give such an air of completeness to the whole composition.

Standing on its broad Doric base, with its sur-base forming a continuation of the plinth of the Corinthian columns, and broken into compartments of *alto-relievo* balusters, the principal story has a very fine effect. The windows are coupled elliptic-arched, resting on square *antæ* of very chaste design. The Corinthian cornice, which surmounts this story, is good; and the fluted columns, with their well-defined capitals, promote the pleasing feelings excited by the whole.

But, an inspection of the illustration will leave no necessity for detailing the points of excellence in this design.

And here, without any intention to detract from Mr. Pfeiffer's design, we would raise the question, as to whether, in the Frontispiece, the centre section would not have been better *recessed*, from the first-story cornice up, thus giving prominence of appearance to the two flanking sections, as they are so much larger than the centre one?

This is purely a matter of taste—isolated it may be—but worthy of a thought. As the centre section of the side on Seventh street is recessed, might not unity of effect have thus been promoted?

We should like to hear from some of our readers on this point.

The internal arrangement of this Bank Building is such, as to meet the requirements of the several parties occupying it.

The Basement, with its Cellar and Fire and Burglar-proof Vaults, is occupied by the Stuyvesant Safe-Deposit Company.

The First, or Principal Story, is occupied by the Proprietors of the building, the METROPOLITAN SAVINGS BANK.

The Second Story contains the Offices of the United States District Internal Revenue Department.

The Third Story is divided into Offices; and

The Fourth Story is used for Masonic Lodge Rooms.

The Building, throughout, is perfectly fire-proof; no combustible material having been used, either externally or internally, where masonry or iron could be employed.

THE METROPOLITAN is but one of the fine buildings, which have been erected, or been remodeled, in New York, by the flourishing Savings Institutions of that city, during the last two or three years; and, as there is a rivalry in this, as in any other of the operations, which have an abiding interest with the public at large, it is fair to presume, that architects will have their time pretty well engaged, ere long, in the matter of "Savings Bank" designs. A word in season, therefore, cannot come amiss.

The architect, who sits down to design a Savings Bank, must keep religiously in view the very nature of the subject he is about to work upon. It is to be composed on principles of economy, without illiberality, elegance, without display, and attractiveness, without undue ornament. Simple, yet fine in its very simplicity, it must be an edifice, that, whilst it gives entire satisfaction to every observer, does not call up an unpleasant question, in the mind of its patrons, concerning the use of the capital so outlaid.

In the selection of the Architectural

Style, that one which affords the most opportunity for the production of effects of light and shade, with the least attendance of ornament, is most needed. *Proportion* is the most desirable feature in such a design, or, in fact, in any design, whatsoever, but, especially, in that of Savings Banks, for the want of it cannot be compensated by ornament. Ornament, unless very judiciously used, is out of place, on such a composition.

As to the *Order*, we should invariably use the Tuscan, as being the simplest; and, at the same time, most consonant to the peculiar purpose. The Roman Doric might be used in the Basement.

Palladio, Scamozzi, and Vignola give us some fine illustrations of the mode of treatment of the Tuscan Order; and even Perrault, allowing for eccentricity of detail, shows the adaptability of this Order. Sir William Chambers, in his incomparable treatise on Civil Architecture, speaks of it in a manner that leaves no doubt, as to its fitness for the plain, the substantial, and the beautiful.

It is not to be thought, that we would rigidly forbid ornamentation, on Savings Banks; or that we would interdict the use of richer Orders. On the contrary, we consider such relief desirable, at times; and, as in the case before us, the NEW YORK METROPOLITAN SAVINGS BANK, where the Corinthian is introduced, we certainly deem it judicious, and especially so, as the architect has exercised a keen caution, in not overstepping the very line we have here drawn attention to.

As regards ornaments on Savings Banks, their presence is as absurd as it would be, for a man, striving to acquire wealth, to wear useless jewelry, merely for ostentation's sake. There are, unhappily, some few instances of thoughtlessness, in this matter, to be now seen in New York Savings Banks; recently remodeled, which, while they do credit to the sculptor, do no credit to the judgment of the designer; and cannot be looked on with favor, by the thrifty

depositor, whose satisfaction, in such matters, is worth all that the unconcerned can feel.

Again we urge the deliberate consideration of this subject on the architect, who proposes to himself the composition of such a design. Let him leave wreaths of flowers and urns—together with masks, lions, and pouncing eagles—out of sight and out of mind; and keep simple elegance, as the most prominent feature; thus producing admiration, without meretricious effort at display. Such admiration is lasting; and worthy of the quiet effort to attain it.

BANKING INSTITUTIONS, in general, are not to be treated in the same manner, as are Savings Banks; because they bespeak, in their architecture, the profusion of wealth, which is the foundation of their existence; they being, in fact, the representative temples of the moneyocracy of the community—and, consequently, bearing, on their front, the insignia of their rank. Florid display, statuary, and all the other accessories of enriched design, are in keeping here, provided their presence is controlled by harmony, modesty, and good taste. In such edifices, the Corinthian or Ionic Orders will be admissible; but not the Composite, that Order being quite too meretricious, for even the affluence of Trade to tolerate.

In the countries of the Old World, the public banking institutions belonging to the Government, their edifices present all the display of architectural design, which we are accustomed to see in all government buildings—great extent, and most imposing appearance. Our own United States Treasury Building, at Washington, D. C., is an example of what a National Bank, in the hands of the General Government, might be.

But, as things are, banking institutions being in the hands of limited companies of citizens, and being, moreover, rather numerous, it is not to be expected that architecture can take the princely range it does in foreign lands.

One of the reasons here is, that there is an imperious necessity for limit of front, to that which is usually occupied by large stores. That highly elaborated building, the Park Bank, is not seventy feet front; and is front, and nothing more. On such a contracted area of display as this, it is evident, that the architect must feel his great difficulty to be the avoidance both of redundancy and of poverty of ornament. The unaided presence of proportion, however unexceptionable in itself, cannot command the attention, so desirable to the true artist. On the contrary, proportion requires the acquisition of ornament, to set it off and draw attention to it. The manner of using such ornament, and the selection of it, alike call for the discrimination and taste of the architect. And, in this lies the main effort, which will test his ability to please the public eye. Failure in ornamentation, however just the proportion, is as fatal to a design, as want of proportion, however admirable the ornamentation.

Let us be clearly understood, then, by our architectural brethren, as desirous of simply sustaining the doctrine of modest neatness, and well-defined economy, for the Savings Bank Buildings; whilst, for the more aspiring Institutions, above alluded to, we advocate the introduction of enrichment, to any extent, not liable to the imputation of gaudiness; proportion, well preserved; and embellishment, in good taste, capable of aiding the production of true effect.

A due attention to the necessities, involved in these matters, will render the study of a composition more perfect; and, certainly, less liable to that criticism, which is so displeasing to the sensitive architect. And we firmly believe, that it is the rule, rather than the exception of a true calling for our profession, to possess that tender characteristic, we so delicately denominate as sensitiveness, and which is ever far easier to wound, than to heal.

TWO ADJOINING CITY DWELLINGS.

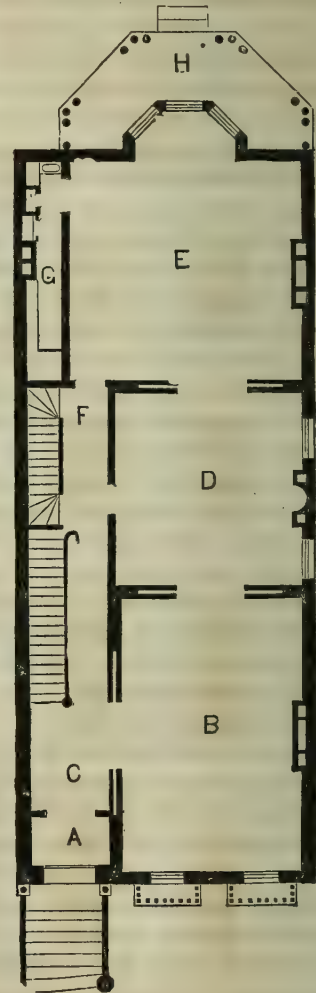
OUR present illustration represents TWO DWELLINGS, which are well adapted for either city or suburban residences. When erected in pairs, with a side yard to each, they are capable of being made most compact and convenient in their arrangement, a width of from eight to twelve feet being given to each yard, leaving an open space of at least sixteen to twenty-four feet between the houses. By this means ample room is obtained for the insertion of side windows, or a bay-window, should such be desired, both for the admission of light, and the purpose of giving a better circulation of air to the central portion of the house. It also has the advantage of giving access to the sun, both upon the side walls and on the grounds, thereby conducing greatly to the comfort and health of the inmates.

The buildings are each twenty-four (24) feet front by sixty-three feet eight inches (63 feet 8 inches) deep, including the thickness of the walls, but exclusive of the Bay-Window, and Verandah in the rear. They are four stories in height, with Attics, and a basement Kitchen beneath the Dining-Room, which, as will be seen, is located in the rear.

The First Story is fourteen feet four and a-half inches (14 feet 4½ inches), the Second is thirteen feet one and a-half inches (13 feet 1½ inches), the Third, eleven feet ten and a-half inches (11 feet 10½ inches), and the Fourth ten feet seven and a-half inches (10 feet 7½ inches)—all from floor to floor—and the Attic story is the usual height, of about eight feet six inches (8 feet 6 inches) in the clear.

Entering the first Suite of Rooms through the Vestibule A—the floor of which should be laid with English encaustic tile, or marble, varied in color, and, in

either case, finished with a rich border, and the wall lined with white marble, about two feet six inches high, paneled and moulded with cap and base, from



First Floor.

the vestibule through the hall—we come to the Parlor, B, a fine room 16 feet by 24 feet, passing through which we reach the Library, D, 16 feet by 16 feet, and, beyond, the Dining-Room E, at the extreme rear, 18 feet deep by 19 feet wide, having a Bay-Window at the end, nine



TWO ADJOINING CITY DWELLINGS: ITALIAN STYLE.

feet wide and six feet deep, octagonal in form. The windows are of French fashion, extending to the floor, with an outer Verandah, entirely surrounding them, five feet wide. These three rooms, the Parlor, Library, and Dining-Room, all communicate one with the other, by means of sliding-doors, six feet wide, finished with elliptic heads, and sliding on ways and sheaves, placed in the head, on which the doors are suspended, thus obviating the necessity of a separation between the carpets of the different apartments.

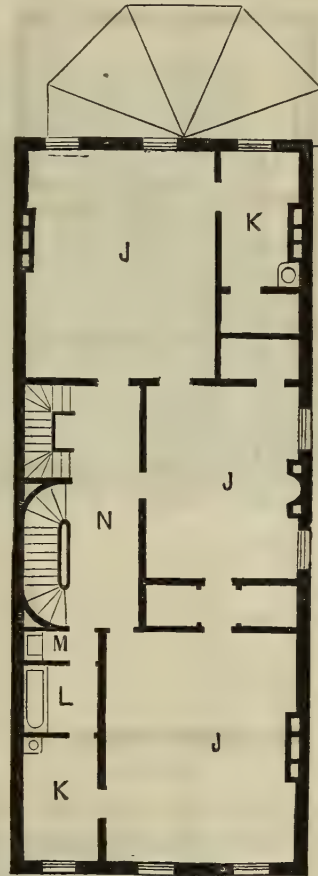
The Doors between the Parlor and the Hall are of the same dimensions and finish as those just described; but all others are to be hung in the ordinary manner. The front doors are in pairs, made with arch heads, and open the full height. The Vestibule Doors are also in pairs, with circular-head light, and glass panels.

Passing through the Vestibule A, as already described, we reach the Entrance Hall C, which is seven feet wide; and contains the Main Stairway, extending from the first floor up to the Attic; and also the Private Flight of Stairs immediately in the rear of the former, marked F, and leading from the basement to the third floor.

Attached to the Dining-Room E is a Butler's Pantry G, which is furnished with a Sink, supplied with hot and cold water, also, a Dumb-Waiter; and is otherwise fitted up with all the necessary modern conveniences. Each of the rooms on this floor is provided with a Mantel and Grate; and also Flues with Registers for warm air. The Library D receives ample light from two side windows, the Parlor B is lighted from the front, and the Dining-Room E from the Bay-Window on the rear.

On the Second Story are three Chambers J, J, J, the front one being 16 feet by 20 feet, the middle 15 feet by 13 feet, and the rear 15 feet by 18 feet, each being provided with large Wardrobe-

Closets, fitted up in the usual manner. Attached to the front and rear Chambers are two Dressing-Rooms, K, K, 12 feet by 7 feet, and 12 feet by 8 feet



Second Floor.

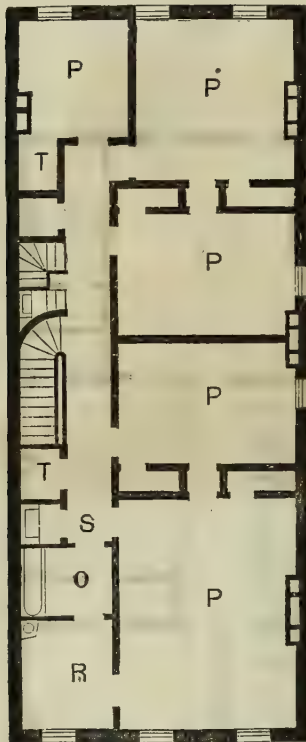
respectively. To the rear of, and communicating with, the front Dressing-Room are the Bath-Room L, 7 feet by 6 feet, with a Water-Closet M adjoining it. At the back of this, is the Hall, N, containing the stairways.

The third story contains five Chambers P, P P, P, P, all furnished with ample Wardrobe-Closets, and a Dressing-Room R, attached to, and communicating with, the Chamber on the front only. To the latter adjoins a Bath-Room O, with Water-Closet S. A Linen-Closet T, is also placed in the Hall.

The arrangement of the fourth story is similar, in every respect, to that of

the third, with the exception of there being no Bath-Room or Water-Closet as in the former.

The Attic story can very readily be



Third Floor.

divided into four good-sized rooms, which would afford ample accommodation for domestics.

The Basement Kitchen is located beneath the Dining-Room E, having exactly the same dimensions, and a Pantry corresponding with the one in the Dining-Room marked as G. A large Range will be required, with Water-Back, &c., and a Circulating-Boiler, holding 60 gallons, of galvanized iron, with all the fixtures and connections; Water-Back, &c.

It will be necessary to have two furnaces, in order thoroughly to warm a building of the dimensions of those we are describing, and to distribute the heat, properly and uniformly, throughout all the apartments. The greatest care should be exercised, in the con-

struction of the Flues, both for the Hot-Air and for Smoke. They should be perfectly uniform in size, and of a very smooth surface. In order to secure these essential points, tin is frequently used as the material for lining the flues, and it is usually built in the wall, during the construction. This is a practice, however, which we disapprove of, as the brick is, in almost every case, laid around the tin, without any regard to system, or regularity; the result of which is, that, in the course of time, the tin corrodes, leaving the flue in such a rough and irregular state, that the friction of the current will not permit any draught, thus leaving it equivalent to no flue at all.

There is another method, which has met with much favor, and is now quite extensively practised, viz., that of using Terra Cotta Pipes, of an oblong shape with round edges. These vary in size; and, being glazed on the inside, form not only a durable, but safe and efficient material for the purpose. They are generally set in flush with the wall; and plastered over, as is done on the surface of the wall. These flues are manufactured, expressly for the purpose, in lengths of twenty-four inches, with connections, register and pipe openings.

Still another mode has been successfully tried, that of building the flues open on the face, from the bottom to the top, and uniform in size throughout. They are afterwards regularly plastered with plasterer's mortar, coated to a smooth surface, and white-coated. They are then covered on the face, with a course of slate, the smooth side inwards, secured to the wall with plaster, and, occasionally, by a nail, driven into the joints of the brickwork. This course of slate is then coated over with the same mortar, and a second layer of slate is bedded firmly in this mortar, the surface of which is then ready for the regular plastering coat.

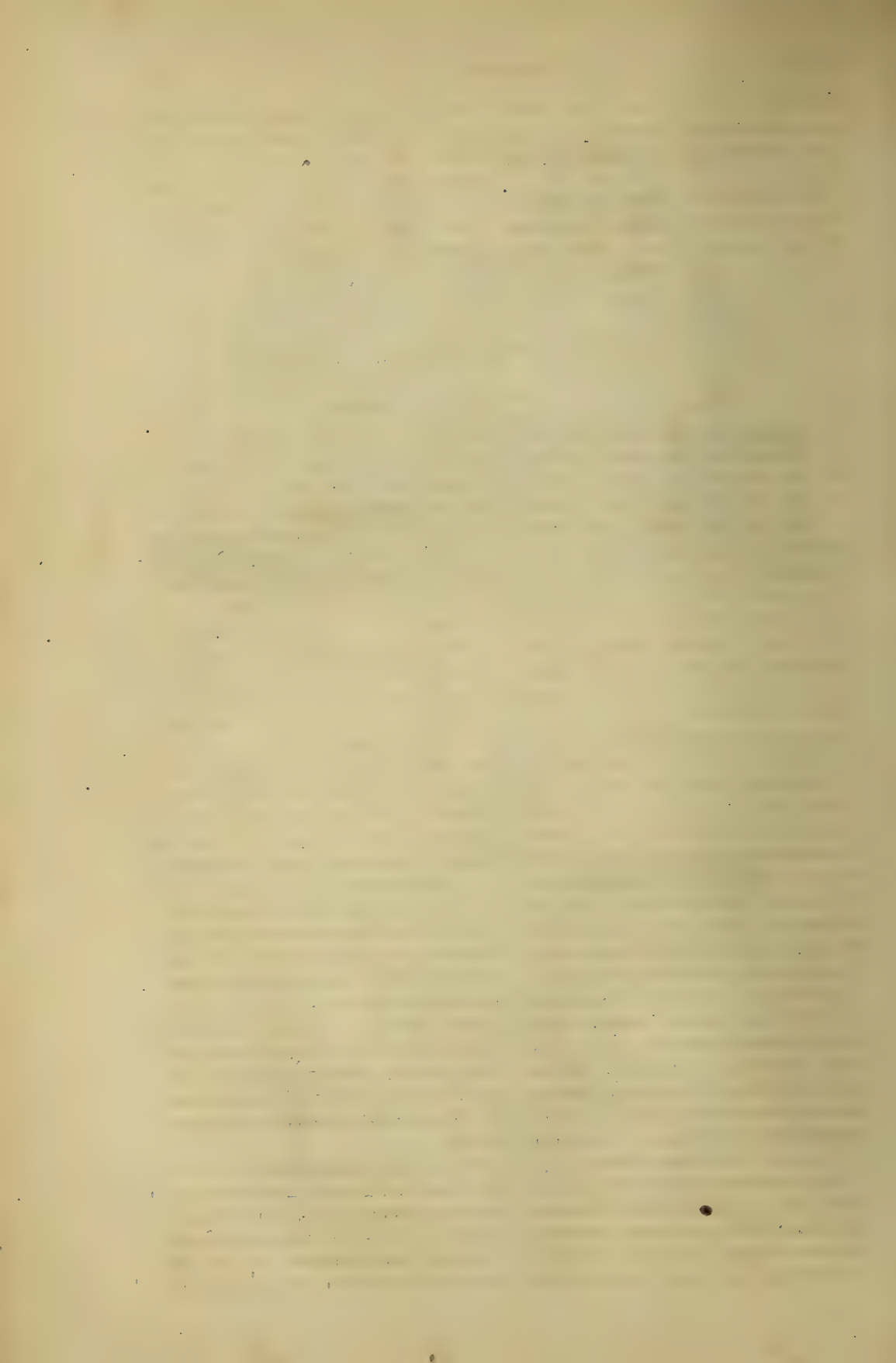
With reference to these different modes of constructing flues, our decided



GOTHIC COTTAGE VILLA. No. 1.



GOTHIC COTTAGE VILLA. No. 2.



preference is in favor of Terra Cotta pipes, whenever it is possible to obtain them, provided they are glazed on the inside.

The intention of the design is, that the front of these buildings should be of stone; although brick, having stone

dressings, may be employed with advantage. The cost of such a structure—erected in a substantial and effective manner, and furnished with all the conveniences appertaining to a modern residence, though nothing extravagant—would be about \$22,000.

A GOTHIC COTTAGE VILLA.

No. 1.

AN accompanying plate, of two subjects, shows the elevation—and, with the text, are two ground plans—of a **GOthic COTTAGE-VILLA**, designed for, and fully adequate to, the accommodation of a family of from six to eight persons.

This residence—as compared with No. 2 of the same plate and similar general description—has some important variations, being, for the most part, introduced as adaptations necessary for the climate of America.

The general features of this Design—No. 1—are very similar to those of its companion, having the same *square-headed and hooded Windows*, and *High steep Roofs and Gables*, but it differs, somewhat, in having a greater number of *Pointed Windows*, in various parts of the building, and principally by the use of the long *Portico or Verandah*, and the upper large open *Balcony or Loggia*, immediately over the Main Entrance.

The Design is simple in its details; yet, with its broken outline, varied heights, broad verandahs or porches, and large projecting bay-windows, affords ample contrasts of light and shade to bestow, upon the whole, that aspect of cheerfulness and elegance so desirable as an element in a Rural Home.

In the design and construction of a Villa, there are three points, which are deserving of the architect's particular attention, namely, the Porch or Portico, the Verandah, and the Chimney-Tops.

The first of these may be regarded as an indispensable necessity in a Country-House, both on the score of real utility, and from its drawing the attention of the stranger; giving importance to the entrance; and also as affording a good opportunity for architectural and decorative display, according to taste.

Verandahs, too, though not, perhaps, exactly indispensable, still, should not be omitted, wherever they can be employed; both, from their being so useful, in affording shelter and protection from the weather, and for sitting in during the heat of the day; and, also, from their being so ornamental and striking a feature in the external appearance of a dwelling, adding to the beauty of the general effect, and not being inconsistent with convenience and enjoyment.

We will now proceed to give a brief description of the ground-plans, although the internal arrangement of this Villa is so simple, that it can be easily comprehended at a glance.

The Entrance, in front, is by a Vestibule **A**, eight (8) feet by ten (10) feet, through which we pass into the Hall, **G**, eight (8) feet wide, containing the Main Stairway leading to the upper Story.

On the right hand side of the Hall is the Drawing-Room **B**, entered through a pair of sliding doors. This room is seventeen (17) feet by twenty-eight (28) feet, with four Windows, two on the front and two on the side, all extending



down to the floor; and opening on the Porch.

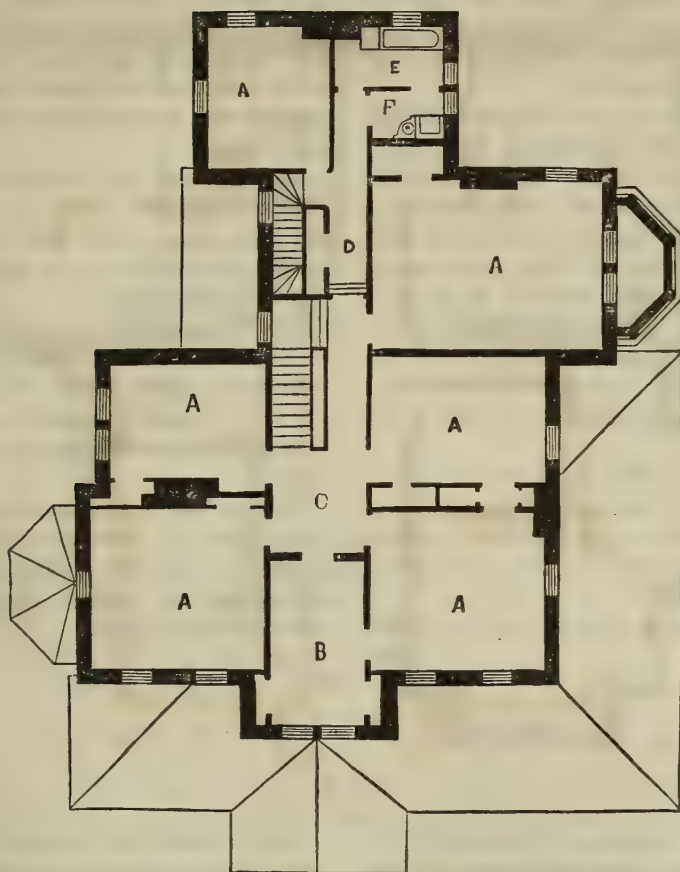
On the opposite side of the Hall is the Reception-Parlor—or, in this case, more properly, Sitting-Room—C, seventeen (17) feet by sixteen (16) feet, having a large octagonal Bay-Window on the side, and two ordinary Windows on the front. This room communicates with the Library E in the rear, twelve (12) feet in depth by fifteen (15) feet in width; and lighted by two windows on the side.

In the rear of the Drawing-Room B, and communicating with it, by means of sliding doors, is the Dining-Room D, sixteen (16) feet wide by twenty-four (24) feet long, having a large Bay-Window at the end, and a single window

on the side. There is an entrance into this Room, also, from the Rear Passage M, leading from the Main Hall G, which contains the Private Stairway to the upper portion of the house, beneath which are the Cellar Stairs, entered directly from the Kitchen F, situated at the extreme rear of the passage M, eighteen (18) feet by sixteen (16) feet, having attached a Kitchen-Pantry I, eight (8) feet square, and a China-Closet H, adjoining, of the same dimensions, the latter communicating as well with the Dining-Room.

The Kitchen is furnished with a Range, Circulating-Boiler, and Sink.

L is a Side Porch, from which there are two Private Entrances, one into the Kitchen F, and the other directly oppo-



site the Dining-Room door. K K are the front and side Verandahs, sufficiently broad to afford ample shade and protection to the rooms. The projecting portion of the Porch, over the Entrance Doors, has an open Balcony, or Loggia, above it, with the Windows opening down to the floor. This completes the description of the first story.

On the second floor there are six Chambers similarly marked A, all of medium size, except the one immediately over the Dining-Room, which is large, with the Window at the end of it opening on to a Balcony, above the Bay-Window below. B is a Boudoir, and C the Main Hall, from which all the principal Chambers are entered. D is a Passage with the Private Stairs, at the

end of which is the Bath-Room E and Lavatory F, fitted up with all the modern conveniences. The whole of the Chambers are furnished with Wardrobe-Closets, and Chimney-Breasts, for mantels.

In this design, much care has been bestowed on one branch of the internal arrangement of a dwelling, overlooked in nine cases out of ten, and seldom, or never thought of, until the omission can no longer be remedied. We refer to the arrangement of the rooms, so as to obtain proper wall-surface, piers, &c., for the several requisite pieces of furniture. This should invariably be borne in mind, in the distribution and location of the doors, windows, chimneys, &c., as a little foresight, at the outset, when

maturing the plan, would save an infinite amount of trouble in the end, when the house is completed and the furniture to provide.

The doors of all chambers should never be so constructed, that, when opened, they expose the bed to any passers through the Hall; but they should open inwards, towards the bed, thus preventing it from being seen, until the person entering is entirely within the apartment. In the same spirit, ample space should be left for beds, bureaux, wash-stands, tables, sofas, pianos, &c., according to the uses of the rooms.

To recur:—The Attic has the same number of rooms, as the Second Story, only of smaller dimensions, some little space being lost by the pitch of the roof.

The Roof is intended to be covered

with slate of varied shape. Shingles are often used for this purpose, in localities where it is an object to employ them; and these are treated in the same manner, viz., making them diamond or other shape.

The roofs of the Porches and Bay-Windows are flat; and must, necessarily, be covered with metal. Tin is preferable, if well painted, on the lower side, before it is laid.

The Chimneys above the roof are, as we have before said, generally prominent traits in this style. They happen to be so situated, however, as to be scarcely discernible in the view we have given.

The cost of the construction of a Cottage-Villa, in accordance with our illustration and ground-plans, and furnished with all modern conveniences, will be about \$10,500.

A GOTHIC COTTAGE VILLA.

No. 2.

IN this illustration, we present a design for a rural residence of a size warranting the designation of Cottage-Villa, which, it will be observed, is in the same style as the preceding one, viz., *GOthic*.

Our intention, here, is, not to present a conception exhibiting all the elaborate and costly display of the domestic Tudor style, for instance, but one, which, suited to any projector of moderate means, would be characterized by convenience, propriety, and the utmost simplicity of decoration compatible with architectural effect, combined with the most essential of all requisites, economy of construction.

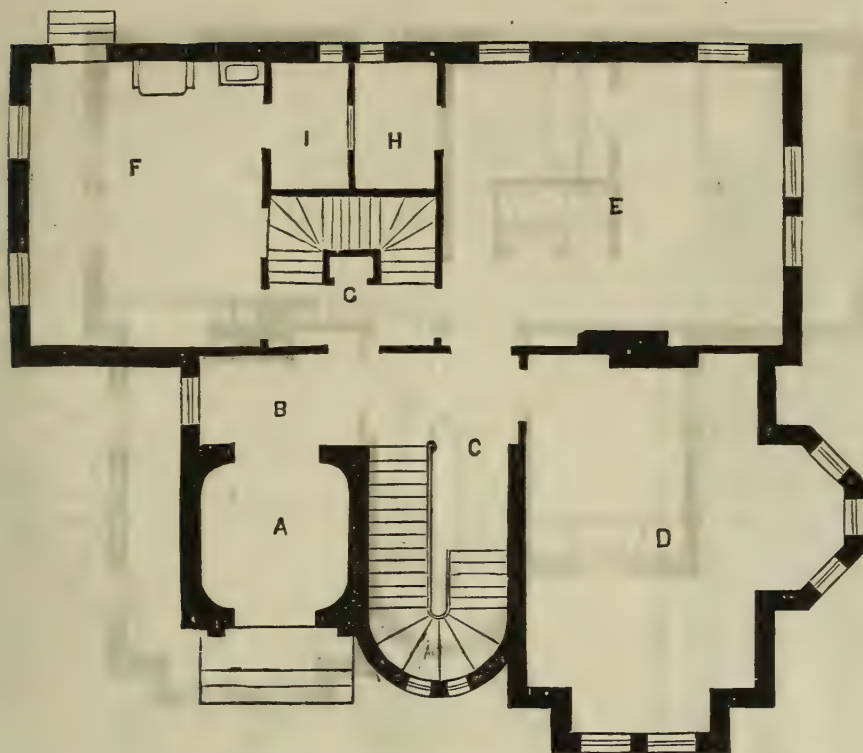
Its general character, and various accommodations will, it is hoped, be easily comprehended by a comparison of the ground-plans with the following detailed description of the parts, through the reference letters thereon.

Before proceeding, we may first, however, briefly notice the external decorative peculiarities of the *GOthic style* in its relation to *Domestic Architecture*, as contrasted with its corresponding characteristics in *Ecclesiastical*.

In the first instance, we may name one of the most striking, viz., that Domestic Gothic rarely uses *pointed* windows, but most generally *square-headed* ones; with a hood moulding, conforming with the head, and terminating in elbows. This peculiarity will be observable in the example before our readers.

Another difference is in the doors, the Domestic never using the common high-pointed doors with pyramidal labels.

Next to the windows and the doors, the most marked characteristic of this style is the gable, of which there are the simple gable of two lines, following the slope of the roof, and the stepped



gable. The apex of the gable is also frequently crowned by the introduction of a slight octagonal shaft, with pinnacle, enriched with ornamental mouldings. The high roof is one more peculiarity, which we may name; and, although this scarcely admitted much ornament, it was not, however, neglected. Relief from sameness was obtained by the employment of shingles, tiles, or, as in this case, slate of different shapes, producing a pleasing alternation of lines. We have hurriedly noticed the most striking differences, which exist in the Gothic Style, according to its application. This subject, nevertheless, deserves a more extended consideration.

This Villa is intended to be constructed of Brick, of an ordinary quality, laid to a smooth even surface, with flat joints; will be two stories high, with an attic story within the roof; and painted French Gray, or some neutral tint.

We will now proceed to explain the references on the ground-plans.

In the first story:—A is the Vestibule, with rounded corners and tile floor, having glass doors, opening into the Hall B. These doors are made in pairs, and equal in width to the front doors. The Hall B, entered through these Vestibule Doors, is six (6) feet wide by eighteen feet six inches (18 feet 6 inches) long, with a return, towards the front, of eight feet wide. This latter portion contains the Main Stairway C, is semi-circular on the front, and is continued up above the roof, forming a circular tower, a most effective and striking feature in the design.

Passing through the Hall, we enter the Parlor D, an apartment nineteen (19) feet long by fourteen (14) wide, with two bay-windows. The one on the side is octagonal, containing three divisions, and that in front is square. This latter projects two feet six inches



(2 feet 6 inches), with a double, or, as it is usually termed, a twin-window; and is carried up two stories in height, as will be seen at a glance on the elevation.

In the rear of the Parlor, but not communicating with it, and also entered from the Hall, is the Dining-Room E, twenty (20) feet long by fifteen (15) feet wide, a well-lighted and convenient-sized apartment, communicating at the rear, through a Pantry H, four feet six inches (4 feet 6 inches) square, and a Kitchen-Pantry I, of the same dimensions, with the Kitchen F, fifteen (15) feet by sixteen (16) feet, which is provided with a Range and Sink.

There is another mode of communication between the Dining-Room and Kitchen, namely, through the Private Passage G, which opens out into the Main Hall B, and contains the Private Stairway.

The Porch, on the front, and along the side of the Entrance, is accessible from the Hall, through the end Window,

which extends to the floor, for that purpose. The Main Entrance Door has a slight Projecting Porch, finished with an ornamental balcony above.

The Second Story has three Chambers A A A, of large size, corresponding, in dimensions, with the apartments immediately beneath them, to wit, the Parlor, Dining-Room, and Kitchen, with one additional Chamber, likewise marked A, eleven feet three inches (11 feet 3 inches) by nine (9) feet, over the Vestibule and Hall.

The Hall B contains the Main Stairway, which continues up to the Attic Story; and the upper section of which is composed altogether of windows.

Communicating with the Hall B is the Private Passage C, on which is the landing of the private stairs, and which opens into the two Chambers at either end, and into a Bath-Room D, seven feet nine inches (7 feet 9 inches) by five feet nine inches (5 feet 9 inches), furnished with every convenience.



GOthic CHURCH. STYLE: PERPENDICULAR MIXED.

The Attic Story contains about an equal amount of accommodation with the second, and has the partitions extended up to the roof. Light for this story is supplied chiefly from the gables, but, also, from two Dormer Windows situated in the rear.

The roof is covered with alternate layers of octagonal and square-angled slate.

The woodwork of the windows and the exterior will be of a dark color, including the Sash and Front Door. The cornices, porches and balconies will be of a two-shades lighter tint than the walls.

The Glass used in the First Story, Front and Bay-Window should be crystal sheet, single thickness, and all the remainder of the best American. All

the glass should be well bedded, bradded, and back-puttied.

The eaves ought to have raised gutters, and a sufficient number of conductors to carry the water quickly to the ground.

The Balconies should all be laid with tin, well soldered and painted beneath, as well as on the top. All the valleys to be also laid with tin, not less than 14 inches wide; and all gutter and valley tin should have the seams soldered on both sides.

The cost of erecting a Villa of this description—based on the existing prices of labor and materials—in accordance with the design we have given, and the foregoing brief description—if in the vicinity of Philadelphia—would be about \$9,000.

DESIGN FOR A GOTHIC CHURCH.

STYLE: PERPENDICULAR MIXED.

ECCLESIASTICAL Architecture has been, in all ages and in every land, the most important branch of the art, the one on which architectural genius and skill have always been mainly expended.

As regards the styles that have been used for edifices of this nature, the earliest, of which we have any mention, can hardly be said to possess any particular style, being generally composed of the ruins of ancient heathen temples and other structures, promiscuously worked up together.

The Byzantine era may be looked upon as the earliest in which style was originated and introduced into such buildings, though this was mostly confined to Asia Minor, until about the 6th century.

It was near this time, that the Lombards settled in Italy; and considerable changes, principally in the details, were effected by them in the mode then exist-

ing; which may be and is called, the "Lombardic." This style flourished in Northern Italy up to the 12th century, or the commencement of the 13th, forming an intermediate link between the debased Roman and the Gothic Style.

By gradual, but marked changes, carried through four or five generations—a grand transition whose points can readily be traced—was at last reached the "most perfect form of Ecclesiastical architecture, pre-eminently termed the "CHRISTIAN STYLE; we need scarcely say, we allude to the **GOthic**, or "POINTED, which, for its solemn grandeur, as well as for its perfect construction, is of all, the most appropriate for a **CHRISTIAN TEMPLE**."

We will not, here, attempt to enter into any dissertation on the Gothic Style, beyond what more particularly relates to the subject of our present illustration, which, as will be seen, is a Church, partaking of the characteristics

of what are called the *Decorated* and the *Perpendicular Divisions* of this style. The several British forms into which it has been classified, according to the different chief variations it passed through, in successive stages, from its primary development, until it gradually dissolved into the *TUDOR, OR DEBASED GOTHIC*; are, according to Rickman, whose arrangement is allowed to be the most simple, as follows:

A. D.

Early English, . . .	1189-1307
Decorated English, . .	1307-1377
Perpendicular, . . .	1377-1630

As to the particular time at which each of these divisions is most accurately defined, there has been much dispute, owing to the very gradual and almost imperceptible manner in which one merged into the other. But the prominent characteristics of each are so strikingly defined, that, when it is seen in its matured and perfect form, no difficulty can be experienced in determining to which it properly belongs.

The features most readily distinguishable are the windows, the shape of the arches, the mouldings, and matters of detail. From these we can generally arrive at a very accurate decision, as to the date of a building.

The windows of the *Decorated Style* are usually of large size, divided into two or more lights by vertical mullions, which are carried upwards, as far as the springing of the arch; and, from that point, branch out into various directions, interlacing and forming patterns of varied and beautiful design, denominated tracery. In the *Perpendicular Style*, the windows vary from those of the first-named in the vertical disposition of the tracery in the heads. The mullions, instead of branching out at the springing of the arch, as in the *Decorated* period, are continued vertically, running up straight from the sill to the head. It was this arrangement of the tracery, in perpendicular lines, that led to the name which has been given to this style,

and forms its most striking characteristic. The illustration before us exhibits the transition period, in which the *Decorated* was gradually, but surely merging into the *Perpendicular*, which is easily noticeable in the forms of the windows, the disposition of the tracery, presenting partly geometrical features, in the form of circles, quatrefoils, trefoils, and rose-windows, and interspersed with wavy and flowing lines. The pinnacles, also, are floriated, and the dripstones of the windows all follow the line of the arch almost to its apex, where they have a concave curve, terminating in a knob of foliage—all characteristic of the *Decorated*.

In the *Decorated*, the tower parapet is most generally adorned with open tracery; but the *Perpendicular* is oftener characterized by embattled, or counter-embattled parapets, the first of these occurring in our design. The tower being a predominating trait, we are thus barely enabled to style our church *Perpendicular Mixed*, as in all other respects these two styles are about equally commingled.

The design we have here given, is for a two-story church. Buildings of this class are now but rarely erected, except in localities, where sufficient space cannot be obtained, and it is a desideratum, to make the best use of the ground in possession. We disapprove entirely of such a style of edifice for the purposes of a church, because some very serious objections can be raised against it. In the first place, the Basement story must either be low in its Ceiling, or the Approach to the Audience-Room, on the main floor, will be made difficult, by long and inconvenient stairways. As the rooms in the Basement would only be employed for Sunday-schools and lecture-rooms, and primary meetings of various kinds, they would only be attended by a limited portion of the congregation, whereas the Audience-Room on the Main floor would be filled by all classes, embracing the old and young,

strong and feeble. For this reason, it is of essential importance, that the latter should be perfectly easy of access, and not be in any way rendered difficult to any member of the church, by unnecessarily long flights of stairs.

In many instances, in our large churches, where there are basement stories, Galleries have also been erected on three sides of the Audience-Room, intended to accommodate from 250 to 300 persons, or nearly half the number for whom there are sittings on the Main floor. This arrangement involves the necessity of having two extra flights of stairs, meeting in the same vestibule, on the front, with the others leading to the basement and from the entrance. When the congregation is dismissed, this causes the vestibule and stairways to be crowded and choked up, rendering egress at all times most unpleasant, and, to many, unbearable.

The popular impression, that the two-story plan is less expensive, than that where Audience-rooms, Sunday-schools, and, in short, all the accommodations required are on one floor—conjoined with limited space—has perhaps been the reason why these two-story edifices have been constructed at all. This idea is founded on the supposition, that the saving is effected, by there being a smaller amount of wall, and roofing; the fact of the additional height of the walls, and the extra thickness required, in order to secure a proper degree of strength—together with the additional length of building necessary to obtain sufficient space for the stairways—being altogether ignored. It has been proved by indisputable figures, backed by actual experiment, that the saving effected, in the one case, is fully counterbalanced by the additional cost, in the other; that the additional stone work in the walls, in the former, is just about equal to the extra height required in the latter; and that the cost of the greater necessary depth of vestibule and stairways is equivalent to the saving on

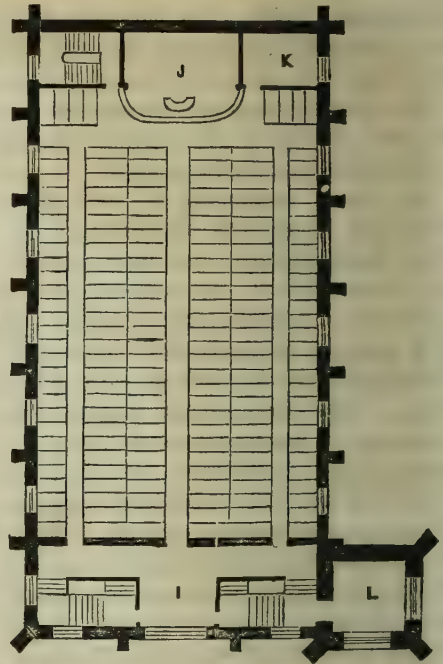
the Roof. There would be no diminution, whatever, in the relative cost in the details of Flooring, Plastering, Painting, Windows, &c., as about an equal amount of each would be requisite in either case. It is our intention, in a future number, to give a detailed Estimate and Bill of Quantities—showing the exact cost of each of two edifices built on these two distinct plans, and having the same capacity in every way—which will corroborate what we have here stated, from our own practical experience and knowledge, that the advantage, if any, is in favor of the plan in which the whole of the accommodation is on one floor.

We must now proceed, however, to take up the subject of our Plate, and to describe the ground-plan in detail. The Church has a Tower at one corner A, eighteen (18) feet square, exclusive of the buttresses, and eighty-six (86) feet high. The Vestibule B is fifteen (15) feet wide; and contains two large stairways, leading to the Audience-room. This Vestibule is accessible from the Tower, and also from the opposite side, or flank, of the building. The Basement rooms are entered, through doors, placed beneath the stairs, into a Centre Vestibule at B, as before mentioned. From this, a passage or Hall, eight feet wide, leads to the Lecture and School-room C, a fine, capacious apartment, 48 feet by 49½ feet. The Infant-school room D lies on the right of the passage, between the Vestibule B and large School-room C, is 20 feet by 28 feet, and entered from the hall—having glass partitions along the Large School-room which can be thrown open, converting the two rooms into one at pleasure.

On the opposite side of the Hall are two Class-rooms E E, each 14 feet by 20 feet, having entrances from the passage, but not communicating one with the other. At the extreme end of the Lecture-room C is a Library F, 9 feet by 12 feet, a recess for a pulpit at G,



Basement Floor.



Main Floor.

and a Stairway H, which connects with the Audience-room above; and has also an entrance door from the outside. This completes the Basement floor.

On the Main floor, or what may be termed the second story, is the Vestibule I, 15 feet wide, containing the landing, which is about seven feet wide, and leaves a clear space in the centre between the several stairs the full width of the Vestibule; and from this point flights of stairs are continued up over the others, leading to the end galleries, that cross the front, having the form of what is called the "Horse-shoe Gallery."

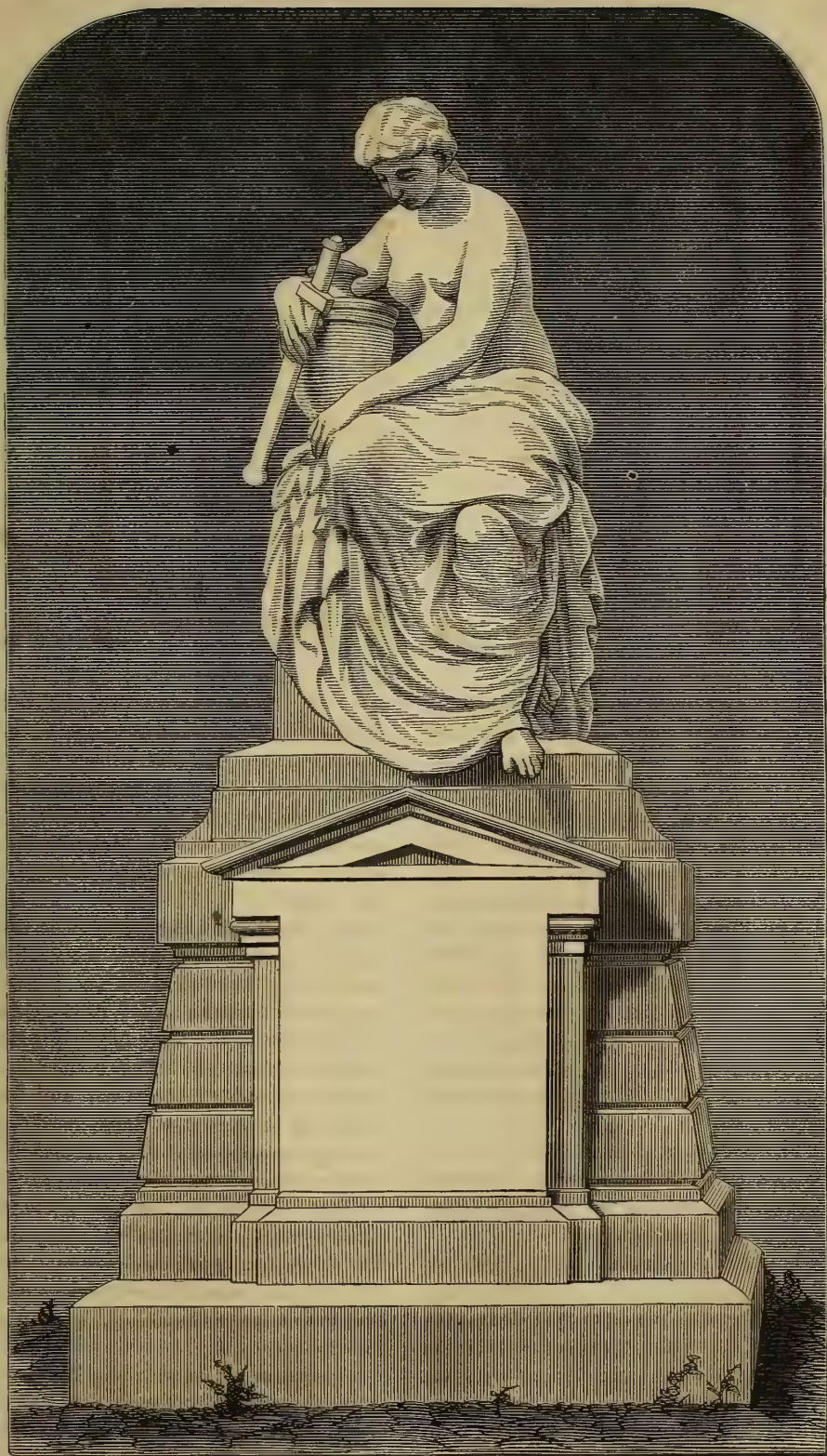
The Pulpit is marked J on the plan, the Study or Robing-room K, and on the opposite side of the building is the rear, or third stairway.

The Audience-room, which includes the whole space contained on this floor, excluding what we have just described, and the Vestibule, is 48 feet wide in the clear and 70 feet long, divided into six blocks of pews, with three aisles, two of which are three feet wide, and the centre one, four feet. With this arrange-

ment of pews, five hundred and sixty (560) persons can be comfortably seated, in addition to one hundred and fifty, for whom there is ample accommodation in the Gallery, making in all 710 as the number to whom the Building will afford sittings, with ample space allotted to each member.

The floor of the Audience-room should be so-formed, as to descend, towards the Pulpit, two inches in every ten feet, or fourteen inches in the entire length of 70 feet. The object of this, is to enable those of the congregation in the rear of the church to see and hear better, as even those whose sense of hearing is acute have more satisfaction from marking the movement of the speaker's lips, while from this alone, the deaf can often follow the discourse. This slant cannot be given without much loss of space, where there is a basement floor, and must necessarily in such cases be forborne.

We propose, at an early day to furnish plates of details of these different plans of churches, both exterior and interior, including corresponding furniture, &c.



AN HEROIC MONUMENT.

DESIGNED AND EXECUTED BY STRUTHERS & SON, PHILADELPHIA.

AN HEROIC MONUMENT.

DESIGNED AND EXECUTED BY MESSRS. STRUTHERS & SON.*

IN this number we present our readers with a choice, full-page engraving of AN HEROIC MONUMENT, already erected at Laurel Hill Cemetery, near Philadelphia, in memory of General Frank E. Patterson, of this city.

Upon a square, slightly tapering, chiseled-rustic pedestal, with obverse and reverse pediment-tablets for the inscriptions, perpendicular, angled double base and compound surbase, is seated a female figure, emblematic of GRIEF. Leaning with her right elbow upon a cinerary urn, she holds in her right hand, just over the edge of the cover, a Roman sword, the scabbard slanting across the body of the urn. The *pose* of this female is exceedingly graceful; and the drapery, thrown carelessly around her, from the hips downward, is managed with extreme skill. Her left foot is advanced, so as to project over the upper portion of the surbase; and the right limb, being crossed underneath behind, the toes of the right foot appear resting against the left leg, somewhat above the ankle. In the one direction, the lines of the right upper arm, the sword, the left arm and both flanks beautifully harmonize; and in the other, the answering lines are those of the head and body, the right hand, the left fingers, both lower limbs—as suggested through the drapery—and the drapery itself; the latter—partly gathered in the left hand, which also holds a laurel wreath—in its flowing folds, finally repeating the varied lines of the entire pedestal. The whole attitude is replete with the dignified expression of profound, but not hopeless melancholy; the head drooping forwards to the right, and the downcast eyes, fixed upon the cover of the urn supposed to contain the ashes of the lamented dead.

The style of the pedestal is Grecian throughout.

The statue is rather above life-size, in order not to appear, from its elevation, less than nature.

The entire MONUMENT is cut in white marble. The statue itself is of Italian; and the base is a monolith from the Stockbridge quarries.

The STATUE OF GRIEF was designed by Mr. J. A. BAILLY, and the pedestal by our esteemed friends, Messrs. STRUTHERS & SON, at whose long-established, extensive, and favorably-known place the entire work was executed.

Upon the occasion of our visit Mr. Bailly was deftly modeling a statue of Col. Ulric Dahlgren, a little larger than life; and close by was the model of a statuette of General Reynolds, who fell at Gettysburg. One of the skilled workmen, under the immediate supervision of the sculptor, was assiduously finishing a gigantic statue of Washington, intended to be placed upon the Chestnut street pavement, immediately in front of Independence Hall.

The Messrs. Struthers employ many artists and skilled artizans; and their extensive and crowded rooms bear, in every direction, the most unmistakable evidence of the business enterprise, capacity, taste, skill, and geniality of the proprietors.

It is very seldom that the highly artistic work, one specimen of which we have so inadequately described, pays at all in a pecuniary sense; but these gentlemen are devoted to their humanizing vocation, and never miss an opportunity for, not only fostering, but adequately mentioning, the fitting genius and talents of their workmen, and extending a true appreciation of the sculptor's art.

* Marble and Sandstone Works, No. 2022 Market street, Philadelphia.

PICTURE GALLERIES.

ONE of the most important and beneficial means of promoting and popularizing the Fine Arts is the establishment of Picture Galleries and Museums. We gather, that even among the ancients, existed the custom of having apartments in the mansions of the rich and noble, for the purpose of displaying choice and valued pictures. This is mentioned by Vitruvius, who very briefly describes these Pinacothecæ, as they were called. In our own times, private collections of paintings and—where these are extensive—galleries have been of common occurrence, as in England, for instance; yet too often formed, not from appreciation and love of the Art, or from a wish to promote its advancement; but from ostentation. The desire to cultivate any art, whether immediately useful, fashionable, or costly, flatters self-love; and is convenient for embellishing the apartments of stately piles. As we have said, this, in England, is too frequently the ruling motive. Still it has, nevertheless, been productive of great benefit to the Art, in disseminating a more general knowledge and creating a more elevated and refined public taste. There are, of course, distinguished exceptions to this, among noblemen and gentlemen, who possess private collections in England; and who—actuated in their formation by the purest and most unselfish motives—have done much to aid the great work of art-refinement, to benefit its professors, and to establish that true taste and feeling, in the great mass of the people, from which alone great results can spring. The infusion of a true feeling of art, among a commercial people, is a work exceedingly slow in its achievement. In America, we are not wanting in the onward march of improvement in the great career of Art. We are also fully awake to the fact, that there is no more certain secu-

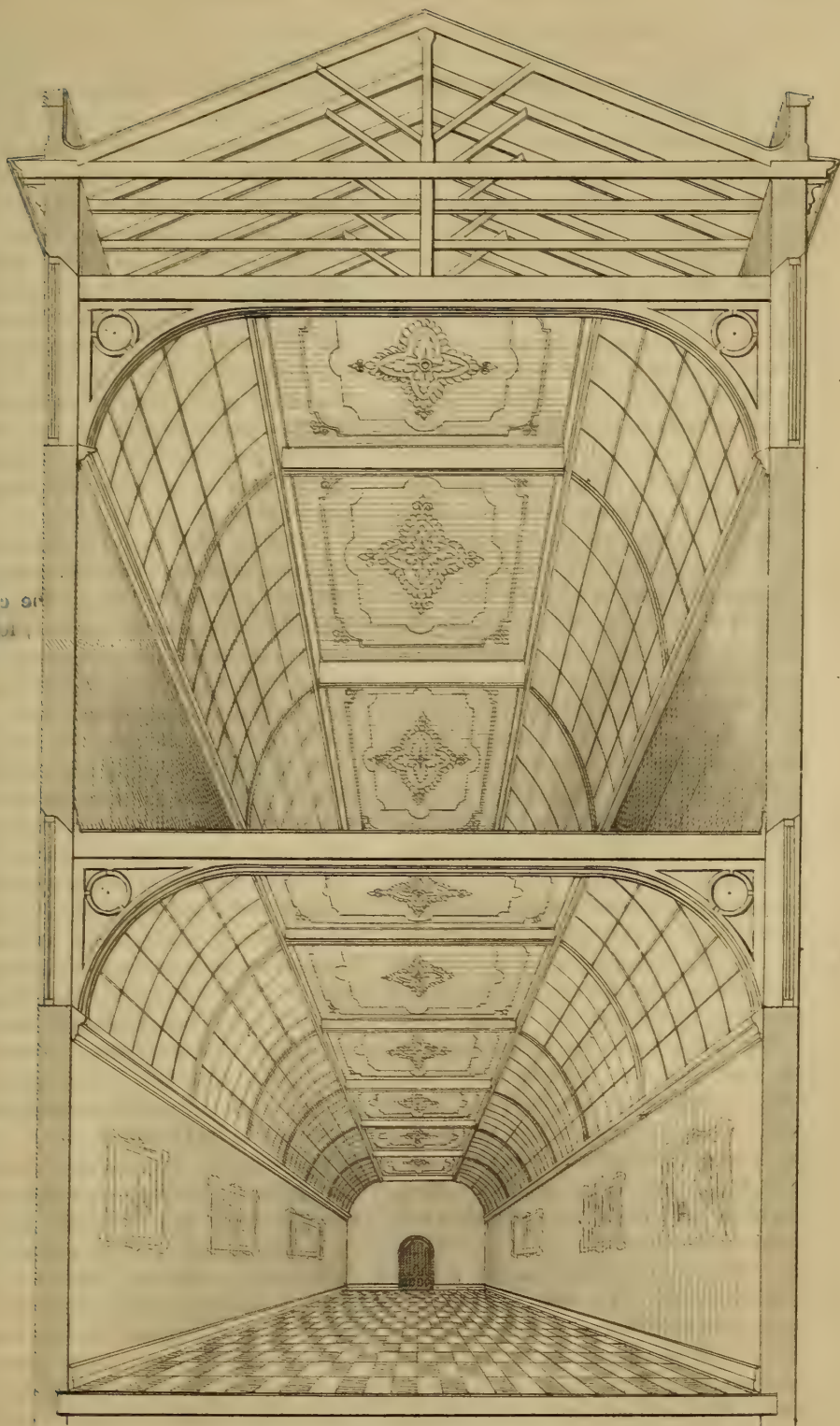
rity for the permanent endurance of a Republic, than the progressive enlargement of the faculties for mental culture and refinement among its citizens.

Private Galleries are now of common occurrence, in all our larger cities, Philadelphia, New York, Boston, Baltimore, &c. They are rapidly becoming, and are considered almost in the light of, necessary appendages to mansions of the *first* class; though not yet *absolute* appendages; and rather to be regarded in the character of luxury and elegance, than necessity.

Still, there are many of our people, who are not content to remain satisfied with the bare attainment of all the *con-*veniences of modern civilization, and the supply of their physical wants and necessities; but who have a craving for enjoyments and elegancies, which may minister to their mental pleasures.

Surely, there is no mode, whereby a cultivated and refined mind can more rationally and laudably acquire enjoyment, than in the possession of pictures, from the contemplation of which can be derived lessons fraught with as profound and valuable instruction, as can be drawn by some from books, from society, or from Nature itself. It enables us to have always at our command, for enjoyment whenever the inclination arises, a rich and inexhaustible mine of knowledge, whence the mind constantly draws more and rarer treasures.

We here quote the words of Addison, to show what a thorough and just appreciation he had of other benefits derivable from a picture gallery. "I frequently," says he, "make a little party, with two or three select friends, to visit any thing curious that may be under cover. My principal entertainments of this kind are pictures, inso-much that, when I have found the weather set in to be very bad, I have



DESIGN FOR A TWO STORY PICTURE GALLERY.

"taken a whole day's journey, to see a
 "gallery that is furnished by the hands
 "of great masters. By this means,
 "when the heavens are filled with clouds,
 "when the earth swims in rain, and all
 "nature wears a lowering countenance,
 "I withdraw myself from these uncom-
 "fortable scenes into the visionary world
 "of art, where I meet with shining land-
 "scapes, gilded triumphs, cheerful faces,
 "and other objects, that fill the mind
 "with gay ideas, and disperse that
 "gloominess, which is apt to hang upon
 "it, in those dark disconsolate seasons."

In Philadelphia there are only four private establishments that can properly and correctly be styled Picture-Galleries, that is, galleries expressly constructed for the purpose, and with a scrupulous adaptation of the building to its object, viz., the Display of Pictures. There are, in addition, a great number of very valuable collections of exquisite paintings, bronzes, statuettes and other antique and recent gems; but these cannot properly be included in the number of galleries, as they are generally distributed throughout several apartments in the house; and there has been no particular construction or arrangement designed for their display. There are a still larger number of gentlemen who may, with great justice, be regarded as real lovers of the Art, who are known to be possessors of some of the most valuable and rare *chefs d'œuvres* of painting.

New York can boast of many more private galleries, collections, and general connoisseurs in the Art, than Philadelphia. Boston, also, and many other cities in our land, all evince that there is abroad an increasing demand for æsthetic enjoyment, an advancing spirit of the age in art-feeling among the few, and an appreciation for the elegant and the beautiful in art among the many. The mind accustomed only to see shapes of beauty will insensibly become habituated to them, and imbibe correct impressions and a portion of their refinement; just as when we dwell amidst

elegance and fashion, our ideas will invariably derive a coloring from them.

We have made the foregoing brief introductory remarks, with reference to the Plate, which we herewith give, exhibiting a view of a projected, two-story Picture Gallery, designed in accordance with a suggestion given us by Joseph Harrison, Esq., a gentleman of much enterprise, well and widely known as one ever ready to lend a helping hand towards the promotion of the Fine Arts, throwing much energy, liberality, and zeal in every channel whereby his labors in the cause can, as a patron, or a benefactor, be brought to bear.

The idea of a Picture Gallery, two or more stories high, as illustrated in the accompanying plate, presented itself to Mr. Harrison during his experience in erecting his present Picture Gallery, which is constructed with a skylight upon the roof, and an inner glass ceiling, through which the light is refracted.

The inner sash, or ceiling, is curved to a quadrant, with the glass in the roof above it, arranged to such an angle, that the rays of light are reflected directly upon the line of wall surface designed for pictures. By this means a most desirable and proper light is obtained, producing just the effect, upon the display of paintings, that was required; and through the arrangement of the gas at night, precisely the same effect is obtained, as during the day.

At the period of the construction of the present gallery, considerable time and study were bestowed on the arrangement and all the details of the scheme; no expense was spared to obtain the best, that could be devised; and, upon its completion, it was pronounced, by all competent judges in art matters, to be as nearly perfect, in adaptation to the purpose for which it was designed, as could possibly be. A slight disadvantage was, however, subsequently discovered, not in any way relating to the manner of the construction, or the principle of the plan, but entirely arising

from extraneous causes, over which the designers had no control. It was found, that, owing to the expansion and contraction of metallic substances—such as tin, copper, lead, or iron, more or less necessary in the construction of a skylight—caused by the remarkably sudden and severe changes from extreme heat to extreme cold, in our very variable climate, and vice-versa, it was impossible to keep the skylight perfectly secure and weather-proof. To obviate this defect, the conception of the new design, which we are about to describe, presented itself to the mind of our townsman and friend, who, with his usual liberality, proposed it for the benefit of any, who may hereafter be anxious to obtain such an accessory to their dwellings, in order that they may have the advantage of the experience he himself has gained, and the thought and careful study he has given the subject. We cordially approve of the suggestion; and recommend it strongly, not only for the reason, that it obviates the difficulty, we have just alluded to, but, also, that it affords so much more available wall surface, each additional story possessing equal advantages, in every way, with the other.

The design, we have under discussion, is thirty-two (32) feet wide in the clear, by sixty (60) feet long, and two stories high. Each story has a wall surface eighteen feet high from the floor to the cornice and springing line of the glass arch, which is the quadrant of a circle of eight feet radius, leaving a centre, or level, ceiling of sixteen (16) feet, which latter is divided into panels, ten feet wide and six inches deep.

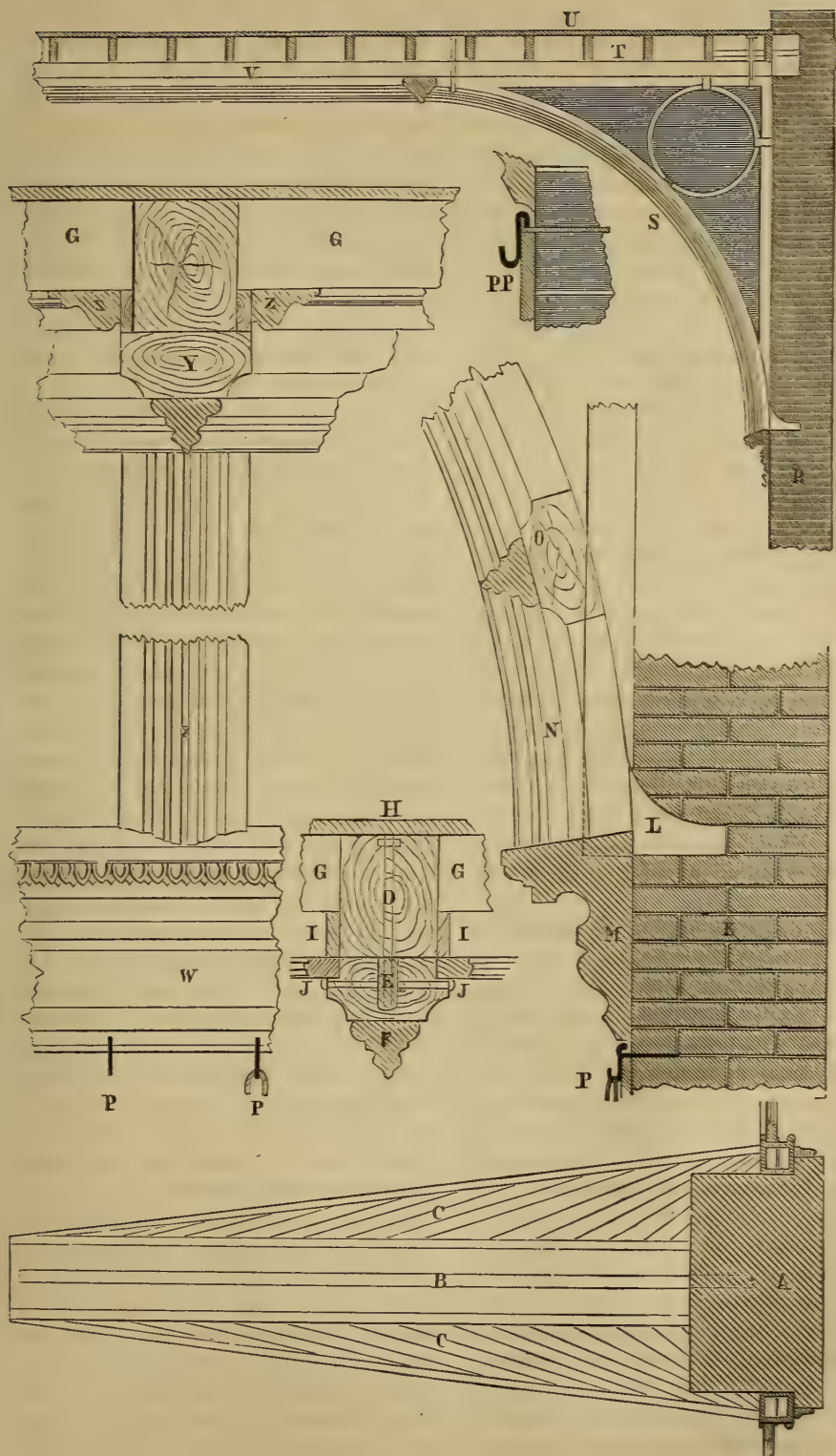
The quarter circle is all of glass, except the ribs. To form this curve, an iron arch is placed in the centre of each brick pier, the piers being ten feet between centres; these are the supporting piers or walls, and are two feet six inches on the face, with seven feet six inches openings in each space for sash.

The iron bracket, in this case, is two

inches thick, and, as buildings differ in width, they must be more or less, in proportion to the width of the building. An iron shoe is cast, on the bottom end, for a rest, or bearing on the wall. The top is bolted to the girder, near the end of the bracket; and at or near the wall. This girder is 6 x 12 inches; and is placed over each bracket, with 1½ inch cleats nailed on the sides, along the bottom, to serve as a bearing for the flooring-joists, running transversely, which are eight inches deep.

The girders have iron clamps, at each end, that extend through the wall, with a neatly finished plate, or rosette washer, on the outside. The exterior windows are ten feet high, and in sections of seven feet wide with two frames to each. The sash and frames are of the ordinary make; and double-hung, in the usual manner, with weights and cords. These exterior windows are placed slightly above the level of the arch, or curved glass ceiling, by which arrangement, the light is refracted through them directly upon the opposite wall, and *vice versa*, upon the same principle, as though there were a skylight. By this means, we have the ordinary windows on the exterior; and avoid all the vexations attendant on the ever-troublesome skylight, with the advantage of not being restricted to one story. The same principle can be applied to any number of stories.

By this arrangement it will at once be seen, that elongation of gallery is no longer an absolute necessity, in the enlargement of picture-space; a most desirable matter, indeed, when the value of the ground to be covered is considered. Light, by this admirable arrangement, we still obtain enough of, whilst we gain the required space; and, moreover, there is an improvement in the light, as we add to the gallery building. The only drawback to this, in all other respects, unquestionable improvement, is the fatigue of ascent. But, surely no one, with a true taste for art, would object to an effort to approach it.



DETAILS OF PICTURE GALLERY.

PRACTICAL CARPENTRY & JOINERY.

DETAILS FOR PICTURE GALLERY.

WE will now proceed with a detailed description of the several parts, from the annexed plate, on which they are drawn to a large scale.

A is the pier, or one of the upbearing portions of the side wall of the building, 2 feet 6 inches long by 18 inches thick. B is the iron bracket, that forms the curve; and gives support and stability to the whole. C C are furring-pieces, on each side of the iron bracket, tapering from the window frame, in the wall, to the curved rib. This surface, being made perfectly white, will add to the reflected rays; while avoiding all offsets for shadows. D is a section of one girder, likewise showing the section of the iron bracket E below it. F is the cornice, running on all the ribs, transversely and horizontally; and, also, following the curve to the cornice, on the wall, at the spring of the arch. G is the flooring-joint, giving the bearing on the cleats, that are nailed to the sides of the girders I; and J is the sash in the curved ceiling, exhibiting the connection with the ribs. K is a vertical section of a part of the outer brick walls. L is the iron brace, or quadrant, displaying the shoe and its bearing on the wall. M is the cornice, on the wall, at the springing-line of the arched ceiling of glass. N is the moulded rib on the arch. O is a section of the same.

P is a plate of iron, about $2\frac{1}{2}$ inches wide by about $\frac{1}{4}$ of an inch thick, with a small turned-up flange on the outer edge, even with the plastering on the walls, and a simple quirk above it, as is usually formed beneath the bottom member of a cornice. Brass or other composition hooks are made to fit neatly on this flange, and play in the quirk. The cords of the pictures are attached

to these hooks, which can be shifted to any point desired, as the flange is made to extend around the entire wall. This contrivance was introduced into the Picture Gallery of Mr. Harrison, at his own suggestion; and proved to be a very great convenience, since universally adopted.

R is a vertical section of the brick wall, on a smaller scale. S is the full quadrant or curve of the arch on the same. T is the girder, exposing the connection with the flooring joists, the iron bracket and the joint-bolt, as they extend through the wall, to bind the whole together. U is the floor, and V the panel on the flat ceiling. W shows the face of the cornice on the wall, at the spring of the arch. Y a section of the rib and the depth of the panel, with moulding at Z, also affords a section through the girder, with the bearings of the joists G G; and X is the face of the rib. P P is the iron flange, with the plate, as inserted in wall, drawn to a larger scale.

From the above description we think a clear idea can be formed of the advantages, which this plan possesses, over the ordinary style of Picture Gallery, so objectionable to exhibiting artists, who always desire the light thus; not to speak of the great addition of wall surface, which this construction gives. But we have already descanted freely upon its merits, and will now leave it with our commendation.

It is as necessary for the Artist, to have a favorable light for the due exposition of his work, as it is for him to have the requisite colors, wherewith to embody his ideas on the canvas. For it is through the aid of Nature's light that he must present Nature's effects.

A BAY - WINDOW.

WE will now resume the branch of PRACTICAL CARPENTRY AND JOINERY.

Our first plate represents a BAY-WINDOW, an architectural feature, which has become an almost universal appendage to our suburban residences, and of late has been frequently introduced into our city mansions. It is often placed on the front of the building, but more generally on the rear, in either situation possessing the same general accessories and characteristics.

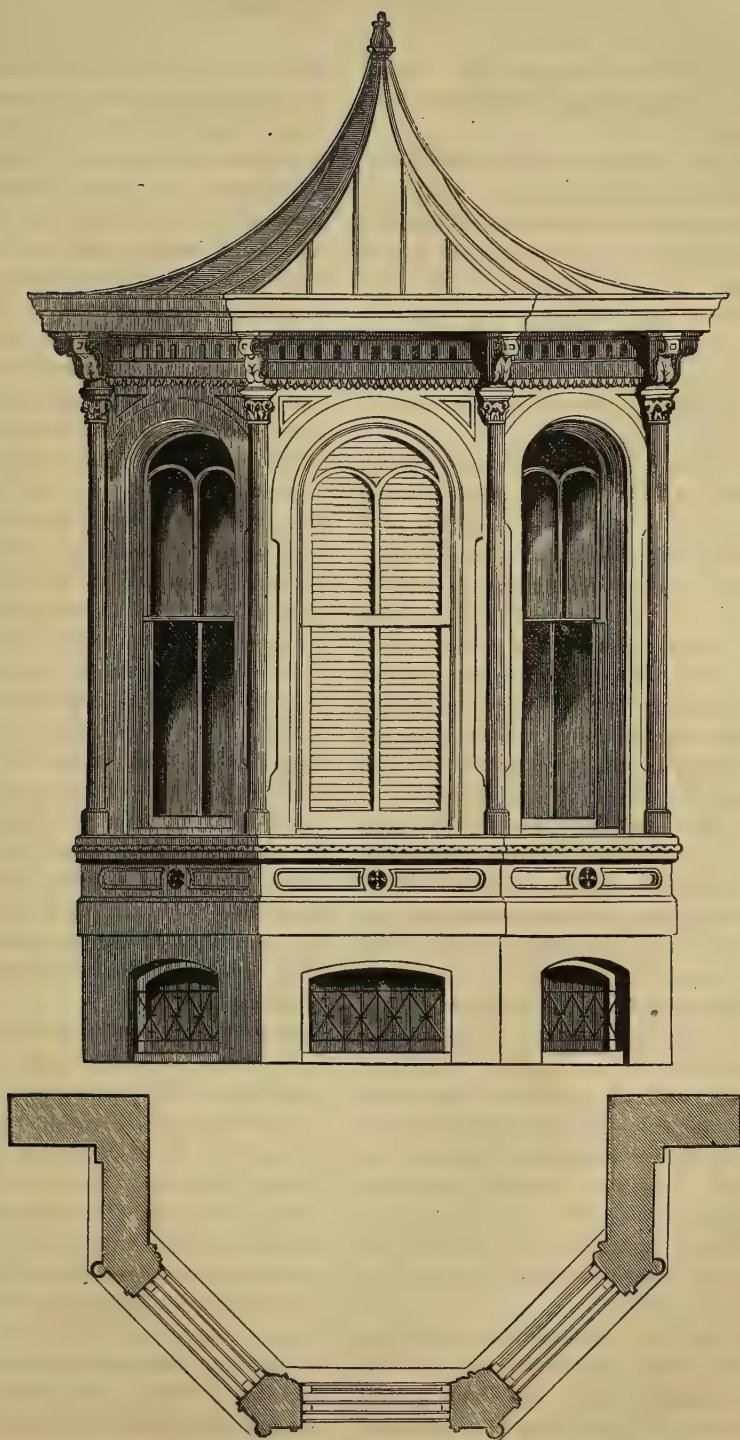
This particular style of window was adopted in England during the Lancastrian and Tudor periods; and, from its capability of forming an agreeable and striking trait in the external appearance of a dwelling, has been always, more or less, in vogue, down to the present time.

The great difficulty always experienced in the construction of these windows has been the attainment of a proper degree of security in the arrangement of the shutters, or blinds. Much thought and study, both theoretically and practically, has been expended on this matter by our mechanics; but, as yet, few methods of solving this problem have been attended with any satisfactory result. The chief obstacle is, that, in the generality of instances where Bay-Windows are introduced, only a given space can be appropriated for the opening, which allowance has to be rendered as available, as mechanical skill and ingenuity can make it, for the purpose of obtaining all the light possible. In order to accomplish this, it is requisite, that some plan be devised which will, at one and the same time, afford the most light and the greatest security.

One method is to have shutters on the outside. This has its advantages and disadvantages, which we will briefly enumerate. In a climate as changeable as that of the United States, where the

temperature ranges from extreme cold to extreme heat, during the various seasons of the year, an outer protection to the glass is beneficial; in the summer, by shielding the glass from the ardent rays of the sun, thus preventing it from becoming heated, and the heat itself from being refracted or reflected into the apartment within; and, in the winter, in a similar manner, by protecting it against the cold wind and frost, which, when in contact with the glass, will be conveyed into the apartment. On the other hand, we cannot speak in any favorable terms of the architectural effect produced by these shutters or Venetian blinds, when placed on the outside of the building: there is nothing attractive, or agreeable to the eye, in the appearance they here make. The great difficulty, that is usually encountered, in placing the shutters on the outside, is the want of wall surface, for opening them back; and their unsightliness, when open. But, on the whole, the benefits derived from their being so placed, in the protection, they afford to the glass, from exposure to the weather, give them a much higher claim to our notice and approval, than another method, which has also been tried, viz., that of blinds within.

One objection to inside blinds is, that the amount of space necessary for the concealment of their folds, when the window is open, occasions an exterior appearance of over-massiveness in the jambs. It is also found, that the depth of the jamb, or the thickness of the wall, in many instances, does not allow soffits to be formed, for receiving the folds. To obviate this difficulty, we are obliged to have recourse to the method of folding one-half, of the entire Bay-Window, to the side jamb; or, in other words, a window and a half to each jamb. This usually makes four or five folds to each



BAY WINDOW.



set, according to the size of the window, and the space allotted in the jamb, for so great a number of shutters, so obtrusive and cumbrous, as seldom to give satisfaction. This plan should never be adopted, except as a last resort.

Still another method has been practised, namely, hanging the shutters with weights, cords and pulleys, in a similar manner to sash, except that it is necessary to have the former out of sight. This can be readily accomplished, by running each section down, behind the panel-back, or wainscot, into a box, formed to receive them. They must necessarily be cut at the meeting-rail of the sash; and work side by side. In cases of this kind, the inside window-sills are hung, with hinges, to the fasciæ beneath them; and lift up perpendicularly, exposing the opening of the box; the shutters will then be, by this means, shoved down; and the sills closed in place, concealing them; and, at the same time, forming a proper finish, with the shutter, either open, or closed.

The design for the Bay-Window, which forms the subject of this description, and the accompanying Plate, is one of rather a novel construction, possessing some advantages over the ordinary mode, the credit of which, we are happy to say, belongs to Joseph S. Keen, Esq., formerly a practical carpenter of this city, a gentleman many years retired from active business, but who still takes a deep and lively interest in its progress. He commenced the practical portion of his career in the workshop of his father—for a long period well known and respected as a Philadelphia builder—where, by patient and untiring industry and indomitable energy, he acquired more than ordinary skill, intelligence and reputation, as a scientific mechanic. Gifted with knowledge in his vocation, he, at an early age, abandoned the pursuit of the art, and followed a profession more congenial to his taste. Still, he has ever kept apace with the onward march of science; and feels no greater

pleasure, than in being able to impart for the benefit of his brother-mechanics, any idea or conception that from time to time suggests itself to his practised mind. A good man needs no higher motive, than the gratification of feeling, that he can, in any way, be of service to his fellow-workers, who have not been, perhaps, so favored by nature, or by opportunities, as he himself. And no one appreciates a scientific and skilful workman more than he who has, himself, spent all his earlier days in working industriously at the same branch, ever looking hopefully forward to the reward of years of labor, which attained, in his riper age, he is ever ready to respect and assist those, who are still struggling on towards the goal, which he himself has reached.

The illustration exhibits a Bay-Window, such as can be constructed, either of stone or of wood. The piers are light, with a slender column, at each angle, and an architrave around the window, in each section. The cornice is finished with a dental course, and a bracket on each angle, above the cap of the column. The roof is covered with tin, having raised ribs on all the seams.

The base, as high as the water-table, should invariably be of stone. Brick may, however, be used, as high as the bed of the table-course, which usually varies from eight inches to one foot in height on the face. Cellar windows, with iron guards, are placed in each section as indicated.

The plan of this window differs, as we have before said, from the mode of construction in general use, being one in which Venetian blinds are required, and arranged upon the outside of the sash. The representation we give, shows the entire window, with the blinds only in the centre opening, as they would appear closed. They are made of the usual thickness; and the full width of the sash—two sections in height, with a mullion in the centre, representing pairs, as usually made, when hung with

hinges. They are hung by weights and cords, with pulley styles, similar to the sash; the upper one, on the outside, and the bottom one, on the opposite, or inside, with a simple parting-strip such as is generally employed for sash. This parting-strip, between the shutters and the sash, should not be less than one and a-half inch thick, to give space for bolts, rods, &c.

The head, in this case, is circular; the slats within the circle being always stationary; and the pivots and rods only extending to the spring of the arch. The pulley-style for the bottom shutter, or blind, must continue up to the crown of the arch-head, with a groove so formed, that the same can be raised up to its full height; and clear the lower sash. By means of this arrangement, the blinds can never be put out of sight; but from their easy and simple management, there would seem to be no necessity for exposing the entire surface of the glass at one time. There is no obstruction to the free passage of the air; and very little, indeed, to the light; while, on the other hand, the sun can be entirely excluded from the apartment at pleasure; at least as readily, as with an inside shade. Compared to all previous existing forms, this mode of finish is certainly the most desirable, so far as real comfort is to be considered, from its extreme simplicity of construction, and the accompanying ease of management by the occupants of the room.

DETAILS OF BAY-WINDOW.

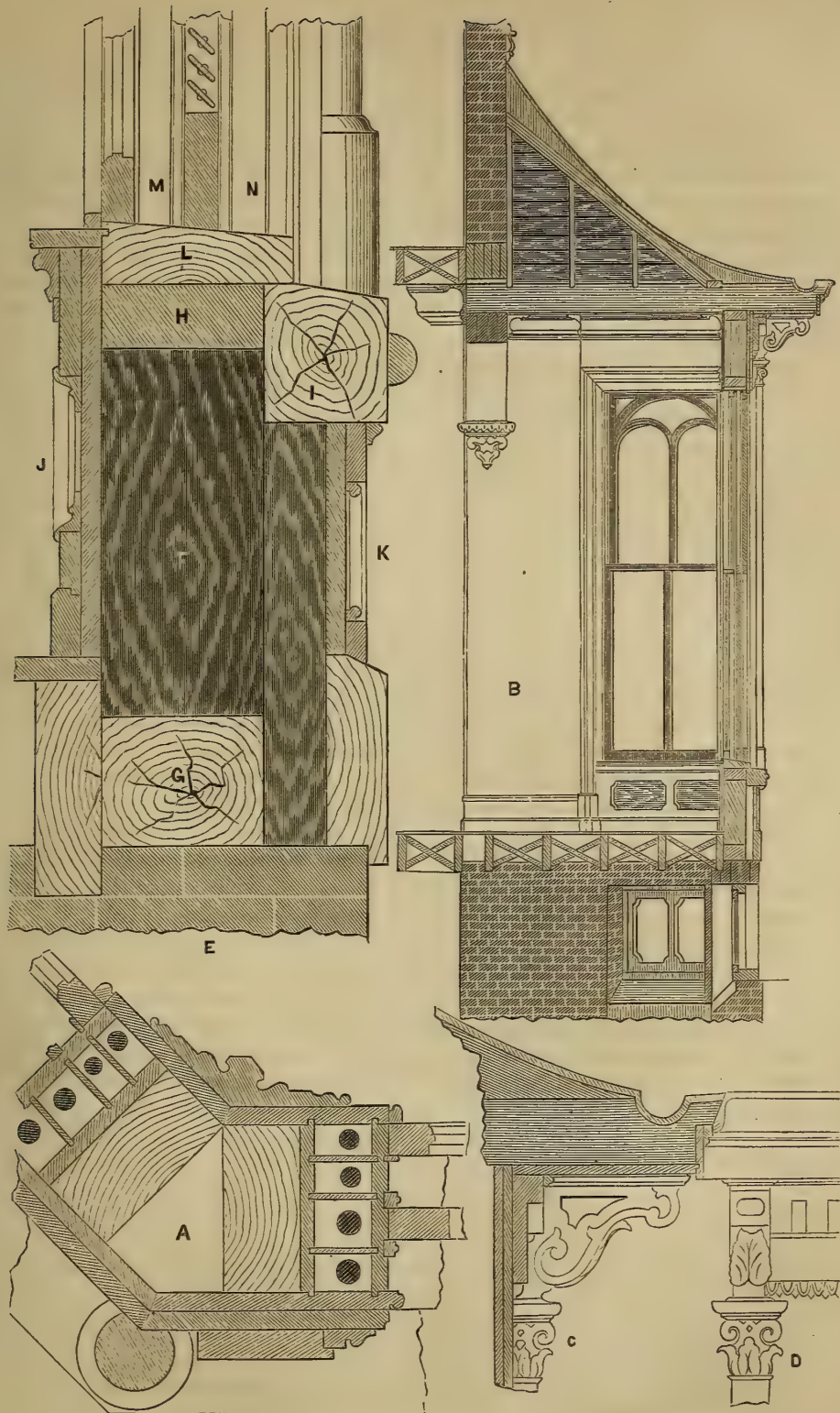
We will now proceed to describe the attached PLATE OF DETAILS, drawn to a large scale, and designed to explain the construction more clearly.

A is the plan of one angle of the window, showing the four boxes for the sash and shutter weights, the inside architrave, and the plan of the exterior finish. B is the vertical section, exhibiting a portion of the wall of the cellar, the cellar windows, and the flooring joists, as bridged. The joists of the second floor, the supporting lintel across the alcove, a section of the arch and the corbel that supports it, the ceiling joists, and the rafters, with the curve of the roof and the cornice are also shown. C is the cornice-bracket, and the cap of the column, on a large scale. D the face of the cap and the cornice. E the cellar wall, on a large scale. F the stud, beneath the window sill. G the sill, as it bears on the wall. H the supporting-piece, beneath the window-sill. I the sub-sill. J the jamb and the panel-back of the window. K the exterior panel, below the sill. L the window-sill. M the sash and pulley-style. N the pulley-style for the outside blinds.

The whole of the above details have been drawn to such a scale, that any ordinary mechanic can comprehend, with readiness, exactly the manner in which it is designed to construct the several parts, so as to form the whole.

PICTURES.

The great aim with every individual, in viewing any natural or artificial object, should be to see a picture. This, comparatively, few people ever do. They observe with great facility and exactness, the various matters in sight, and all of them at an instant; but simply as a number of detached things. In consequence, they never really enjoy, either nature, or her pictured similitudes in a thorough manner. Only the one, who can see a picture, can draw a picture. The principles of pictorial presentation depend upon the proper representation of outlines on a plane surface, named *linear perspective*; upon the management of distance by the gradual attenuation of tints, suggesting the presence of atmosphere, termed *aërial perspective*; and upon the disposition of light and shade, called *effect*.



WEST.S.C.

DETAILS OF BAY WINDOW.

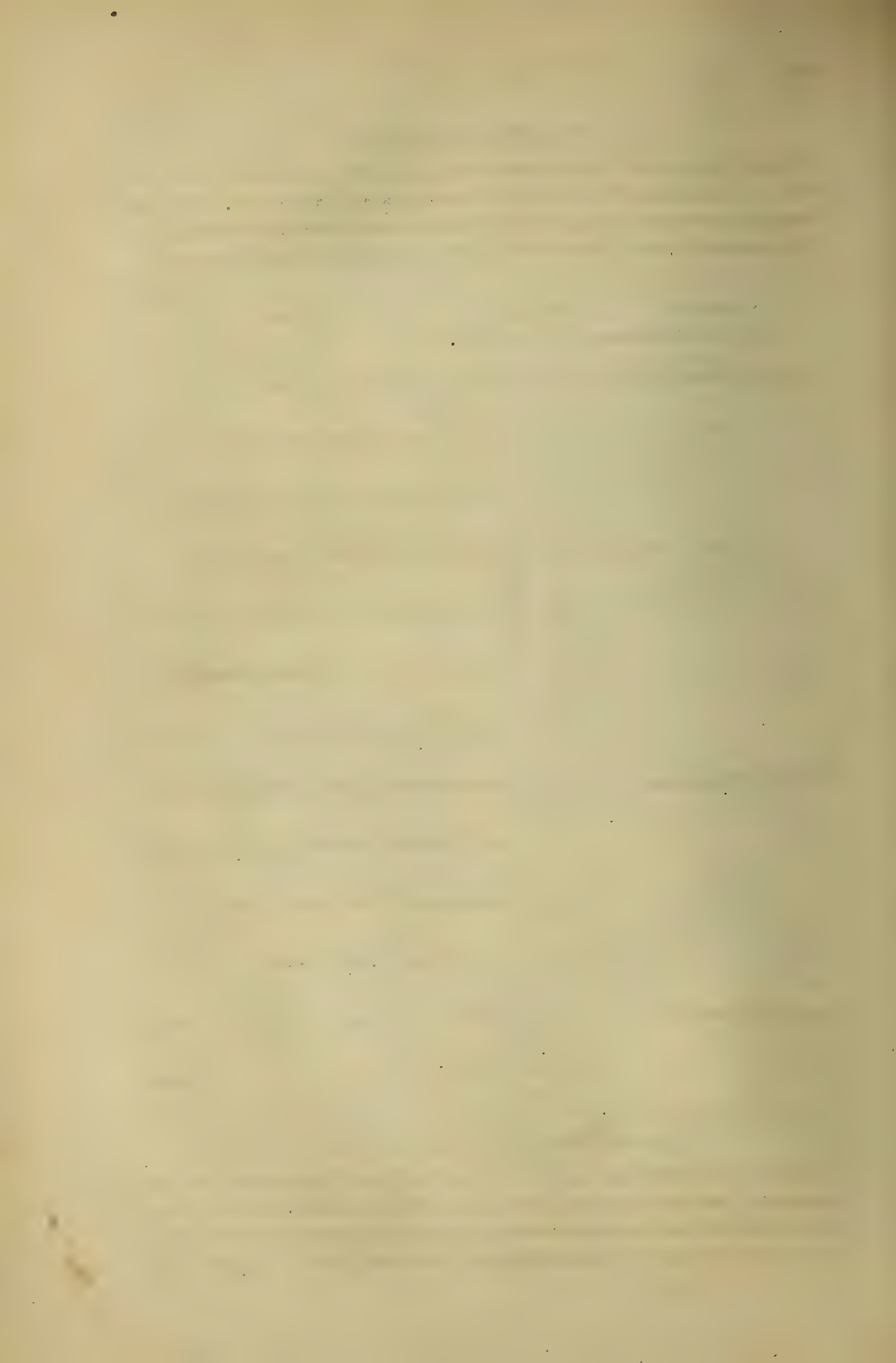


PLATE GLASS.

We have been enabled, through the kindness of our friend, Mr. B. H. Shoemaker, to prepare the following TABLE OF HAMMERED, or ROUGH, and RIBBED, or FLUTED PLATE GLASS, showing the sizes and thickness of which they can be obtained, for the purposes of FLOORS, VAULTS, SKYLIGHTS, CONSERVATORIES and GRAPERIES.

DESCRIPTION.	THICKNESS.	SIZE IN INCHES.					
<i>Hammered Glass for Floors...</i>	$1\frac{1}{4}$ inch.	20×20	24×24	24×30	24×36		
“ “ “ “ ...	1 “	24×48	24×72	36×72	36×96	48×60	48×72
“ “ “ “ ...	$\frac{3}{4}$ “	24×60	24×96	36×60	36×84	48×72	60×60
“ “ “ <i>Skylights</i>	$\frac{1}{2}$ “	24×60	24×72	24×84	24×96	24×108	
“ “ “ “	$\frac{3}{8}$ “	30×60	30×72	30×84	30×96	30×120	60×72
“ “ “ “	$\frac{3}{8}$ “	36×72	36×96	40×72	48×60	48×84	72×84
“ “ “ “	$\frac{1}{4}$ “	24×60	24×72	24×84	30×60	30×72	30×84
<i>Fluted or Ribbed Glass “</i>	$\frac{3}{8}$ “	20×60	20×70	24×72	24×84	30×80	36×90
“ “ “ “	$\frac{1}{4}$ “	24×60	24×72	30×60	30×70	36×72	36×84
“ “ “ “	$\frac{3}{16}$ “	24×60	20×50	24×72	26×80	28×76	
“ “ “ “	$\frac{1}{8}$ “	12×48	12×60	18×60	16×38		
<i>Hammered Glass Bent.....</i>	$\frac{1}{4}$ “	12×48		to			24×60
“ “ “	$\frac{1}{2}$ “	24×48		to			24×84

SPHERICAL GLASS DOMES

Are made of one piece of cast plate, half an inch thick, and from three feet to eight in diameter. They are employed for the top of circular skylights, thus avoiding the use of all bars and joints, and insuring a perfectly water-proof skylight. They are finished *plain*, as *rough glass* or *ground*; and *when used for dwellings*, are *handsomely ornamented* IN COLORS.

A HISTORY OF ARCHITECTURE: THE HINDOO.

THE SACRED EDIFICES OF HINDUSTAN, from their acknowledged profound antiquity, the stupendous nature of their construction, and the colossal sculptures, with which they are covered and embellished so profusely, have been deservedly the subject of deep research and discussion, among antiquarians of our day.

Ingenuity has been taxed to the utmost, and conjecture exhausted, in the various theories, that from time to time have been propounded, as to what period, in the history of our globe, these gigantic structures and excavations were conceived, and brought into existence; for what purposes they were originally intended; and as to the meaning of the sculptured figures on their walls. It would be a needless waste of time for us to recapitulate all these theories, the more so, that they would only tend to bewilder and confuse the general reader. They are well worthy the patient and careful consideration of any art-student, and would amply repay the trouble. Suffice it for us to say, that there is great difference of opinion, among the highest and most learned authorities, as to the antiquity of both the wonderful ROCK-CUT TEMPLES and the PAGODAS OF HINDOO ARCHITECTURE, while there are few circumstances, to prove which is right.

The most general belief is, that, upwards of twenty centuries ago, there existed, in the East, a nation who, if we may judge by the ancient records of history, and the monumental remains of their art, must have been very far advanced, indeed, in a state of civilization and knowledge of the fine arts. Of their Domestic Architecture, we have, now, no certain knowledge, as the grandeur, magnificence and wealth of their cities, —the ancient Oude, Lahore, Delhi, Agra and Canouge,—have passed away, with their political greatness; and are now

but matters of very vague and conflicting history. From the most reliable sources, however, we gather that Oude, the capital of the province of *Oude*, in the northeast of Bengal, was the first imperial city of Hindustan; and, by the most moderate computation, is said to have extended over a line of 40 miles in length. It remained the imperial city for 1500 years, till about 1000 B. C., when one of the Emperors changed the seat of Government to a city called "*Canouge*," on the banks of the Ganges, which, in time, rose to be, according to Arrian, "the greatest city among the Indians." Its form was quadrangular, the sides eight miles long, surrounded by wooden fortifications, with 570 towers or turrets for archers to shoot from, and 65 gates or entrances into the city. Canouge flourished, with more or less steadiness, under successive monarchs, down to the beginning of the sixth century, when it began to decline. Delhi, having been added to their dominions, became the metropolis of India. Even then, it is said to have contained 30,000 shops in its bazaars, which sold only Betel-nut. Delhi, Lahore, and Agra cannot boast of the antiquity of the two cities we have named; and have never been their equals in point of extent; although, it may be, they have surpassed them in splendor and magnificence.

However, as before remarked, we now know little, or nothing, of the state of the Domestic Architecture of Hindustan, at that remote period; but—the Religion of that country having ever remained unchanged through the decadence and fall of successive dynasties, we are able—through the grand and wonderful temples, which are to be found to this day, in various parts of that vast continent, in a more or less perfect state of preservation, silent but unerring wit-

nesses of the past,—to get a glimpse into, and form some, it may be but a faint and imperfect, conception of a race, who flourished and decayed, so many centuries ago.

There can be but little doubt, we think, that those majestic and sublime constructions,—which stand unrivalled to this day in grand and colossal proportions, and awe-inspiring beauty,—and of which we will endeavor to give, hereafter, a brief description,—are of a birth coeval with, if not anterior to, the Pyramids of Egypt.

The attempt has been made to argue,—as a proof of their greater age, than that of the Egyptian monumental remains,—that we, of this day, are in possession of every possible proof, as to the founders of the latter; and can tell almost, if not quite, the exact year and reign, in which they were built; but we are yet groping in utter darkness,—with not a ray of light, to guide us in any way,—as to the origin or date of these other, if possible, still more stupendous and wonderful temples—excavations in and from the solid living rock—fairly hewn out with the hammer and the chisel, a work to fashion which must have occupied an immense concourse of laborers many lengthening years. This reasoning, however, will not yield a single date. Indeed, it is fruitless, at the best, because we have really nothing definite, to assist us in our research.

We assume little or nothing, however, in saying, that the best informed, upon the chronology of the styles, assign to these artificial cave temples an antiquity far higher, than the stupendous remains of ancient Egypt.

Of these excavated temples, there are numerous and extensive examples, to be found in different parts of Hindustan: in some cases, quite plain; in others, again, profusely covered and embellished with sculptures of the most diversified forms and figures. They are to be met with in Balkh, Cabul and Cashmere.

But the most famous are those of ELEPHANTA, SALSETTE and ELLORA, all in the vicinity of Bombay. Of these latter, we will proceed to give a brief description; and, from it, the reader will be able to form a pretty good general idea as to the character of all excavations of this nature.

ELEPHANTA is a small island, about 3 miles distant from Bombay; and is so named from the fact of there being a colossal carved representation, in the living rock, of an Elephant, on the southern shore of the island. The cave is half way up the side of a mountain; and in dimensions about 120 feet square and 18 feet high. It is entirely excavated out of solid rock, having its entrance on the north. The mass of the solid rock roof, which in this cavern is flat, is supported by four rows of columns of graceful proportions,—of entirely a different order, or style, from that of any other known, and of form differing from any prescribed rules,—regularly disposed; and each standing on a square pedestal, beautifully fluted. The shape of these columns is of that peculiar to this and the Egyptian architecture, not cylindrical, but bulging out towards the centre. The capitals of these columns are also fluted, similarly to the columns themselves. On the tops of these pillars runs a stone ridge, cut out of rock, resembling a beam, about one foot thick; and the roof is carved to represent timbers.

Upon the sides of this immense cavern are ranged, in every direction, mighty and gigantic statues, sculptured out of the face of the rock, in graceful and correct proportions, but not detached from the side of the cave. These sculptured figures are 40 or 50 in number, and 12 to 15 feet in height, some having the head surmounted by a helmet of a pyramidal form, others, again, wearing crowns of elaborate devices, and still others with only their own flowing and curled locks. Some of these figures have four, others six hands, grasping sceptres,

shields, and other emblems of peace and war. The execution of their features is very remarkable for the diversity of character exhibited, accurately portraying the various mental emotions, and highly calculated to strike awe and dread into the minds of the worshippers of that mysterious religion, whose influence once thronged these subterranean temples.

We cannot describe all the figures, which are scattered in such profusion, through this cave; but one particularly deserves our notice. It stands at the southern side, immediately facing the entrance; and is of enormous proportions, being undoubtedly a bust of the Triple Deity of India in his triune character of Brahma, the creator, Vishnu, the preserver, and Seeva, the destroyer. The face in front is 5 feet long, the nose alone being $1\frac{1}{2}$ feet; and the extreme width, from cheek to cheek, is $3\frac{1}{2}$ feet. The entire breadth between the shoulders is nearly 20 feet; and the height of the whole bust, from base to the top of the cap, is 15 feet. In his right hand the idol grasps a snake one foot thick; and the features of the three faces are remarkable for the correctness with which they characterize the three persons of the Trinity, as it may be called. On each side of this bust is a colossal figure, leaning on a dwarf. At the west end of the cave, there is a dark recess 20 feet square, which is perfectly plain, with an altar in the centre. Eight gigantic figures guard the four doorways to the recess, one on either side of each portal. These figures are perfectly naked, $13\frac{1}{2}$ feet high; and finely sculptured; evidencing, from their harmonious proportions, the life-like presentation of the mental emotions depicted on their countenances, and the muscular development of the different attitudes, a very high degree of refinement and culture in the art statuesque. The heads of these rock figures are covered, like those of the other statues; and they are represented as wearing collars

round their necks, and jewels in their ears, all richly ornamented.

It would be taking up too much of our space, and doubtless be wearisome to our readers, to describe any of the other sculpturings of men and beasts, that are to be found in this remarkable cave. They are of all sizes, and of all varieties, except that, in the entire interior, there is only one female, represented with a single breast, which has been supposed by some, to personate an Amazon, but which is more likely to be, according to Elmes, a representative of the consort of Seeva, exhibiting the active power of her lord, known under her three names of Bhawanee, Isanee, and Doorga. Some of these figures have 2, others 4, and others, again, 6 hands, generally grasping snakes, shields, tridents, maces, swords, and other symbolic emblems; and many of them are ornamented with representations of armlets and anklets, very much resembling similar ornaments worn at the present day in the East.

There exists ample proof to warrant our asserting, that this temple, in common with the others of a similar nature—to be found, as we have said before, in India,—were originally excavated for strictly devotional purposes; and that there exists a truly marvelous similarity, in almost all the principal points, between the religion of that remote period and that of the present time.

We must now proceed to the CAVES OF SALSETTE, or rather of CANARAH, in the island of Salsette, which latter is about 70 miles in circumference, 20 miles long and 15 broad, and separated from Bombay by a channel. These excavations are so numerous and extensive, that they have been compared by one traveler to a *town*.

They are hewn out on the side of four hills, in the centre of the island, carved in four galleries, leading to separate ranges of chambers, or apartments, in all amounting to the astounding number of 300. These galleries are literally

crowded with sculptured figures; there being not fewer than 600 throughout these caves, including 90 in the great Pagoda itself. This latter is 40 feet high, to the crown of the arch. We have omitted to mention, that the roof of this temple differs from that of Elephanta in being arched, supported by rows of pillars, 35 in number, 5 feet in diameter, of an octagonal form, and arranged with great regularity. The bases and capitals of these pillars are richly ornamented with figures of elephants, horses and tigers most truthfully and accurately carved. The temple is 84 feet long and 16 feet broad. There is a large vestibule, adorned with columns, having capitals and bases, and in which are two celebrated colossal statues, 27 feet high, standing one on each side of the entrance to the temple. These figures are, like the rest, beautifully proportioned, and present the appearance of having been once painted. At the farther end, there is a stupendous altar, of a convex form, 27 feet high and 20 in diameter; and surrounding it are recesses, hewn out of the rock, for lamps. The general appearance of these excavations is considered as being, if possible, still more grand than that of Elephanta, and bearing equally indisputable marks of remote antiquity.

But even these intra-petrea temples, again, are surpassed by those of ELLORA—a town situated 18 miles from Aurungabad, in the Deccan—which, in the magnitude and extent of the excavations, and the beauty and grandeur of the sculptured figures, far excel any other works of a similar nature in Hindustan. There are no less than 16 distinct Pagodas or temples in these excavations, all of which are crowded with colossal figures and representations in relief of all the personages of the Hindoo Mythology, and embellished with the most lavish ornamentation of the style peculiar to that era. By actual measurement, the principal Pagoda has been

ascertained to be 247 feet long, 150 feet broad, and 90 feet high.

Any detailed description of these would, however, here be out of place, as, in the main, a mere repetition of what we have already said concerning the caves of Elephanta and Salsette. It will give the reader, perhaps, a faint conception of the stupendous vastness of these monuments of antiquity, when we say, that it was the opinion of an artist employed to take measurement and make drawings of them, that, to excavate and carve them, must have cost the labor of 40,000 men for 40 consecutive years!

We have hitherto confined our description to those temples of Hindustan, which were formed by excavating the sides of rocky mountains. There were other forms of these ancient structures, however, that we must not pass by, without making a few cursory remarks. *Some, of pyramidal form, were constructed of huge stones, rudely put together, and diminished by steps—as at Tanjore and Deogur. Others, again, were composed of square or oblong courts of enormous dimensions.* The stones composing them were of a size hardly credible. The gateway of a Pagoda, on the coast of Coromandel, still existing at the present day, leads under a pyramid, 120 feet high. The circumference of the outer wall of another is four miles; and the stones composing the roof of the gateway are 33 feet in length, and $5\frac{1}{2}$ feet in breadth.

We have temples of still more varied forms, and entirely different construction, scattered throughout the East, which, although not boasting of such a great antiquity as the Rock-cut Temples, are equally deserving of mention. There are some *in the form of a cross*: for instance, the celebrated one on the Ganges at Benares, in Bengal. This temple is in the shape of a great cross, with a cupola in the centre. Others, again, are circular, of which the most noted one is Juggernath, near Point Palmyras, in the Province of Orissah, which is con-

sidered by some to be one of the most ancient of all Indian temples.

In the Burman Empire, again,—where the religion of Godama has flourished for centuries, in all its purity and simplicity,—the Pagodas are built in a pyramidal form, of brick throughout, and, in nearly every instance, constructed on artificial elevations. Many of them are of great height, ranging from 100 to nearly 400 feet in perpendicular elevation, and being often gilded—if not completely, at least on the upper portion—their exteriors have a truly charming and elegant effect, embosomed, as they generally are, in the dense jungles and forests of Burmah.

One of these PAGODAS deserves particular mention, being regarded as the most ancient in the country. We refer to that near the ancient city of Pegu, about 60 miles northeast of Rangoon, and some 20 miles inland from the sea. It is called the SHUAY MAHDAW, and is still in a fine state of preservation, although it dates its origin so far back as 600 B. C. The form of this temple is, as we have first remarked, that of a pyramid. It is constructed entirely of brick, tapering most elegantly up to a point. Its diameter at base is 162 feet, and it is built upon a double terrace, of a quadrangular form, the sides of the lower rise being each 1400 feet in length, and those of the upper 684 feet. On these terraces are erected the residences of the priests and the Pagoda slaves, and also idol-houses, all principally of wood, and quite richly and profusely embellished with the most grotesque wood carvings and plastered brick figures of Godama in every possible position, erect, sitting, recumbent, etc. On the top of the Pagoda itself, there is an Umbrella, or *Tee* in the vernacular—an open iron frame in the shape of an umbrella—which surmounts the whole structure, is invariably gilt, and from which are suspended numberless bells, which, agitated by the wind, produce very pleasant and agreeable sounds.

In concluding this article, we would wish to say a few words about the Hindoo Architecture of the present day, although, indeed, the subject unhappily does not admit of any lengthened description.

The style of Domestic Architecture now in use in Hindustan presents no characteristics, whatever, that would strike the observer with any other feelings, than those of wonder and of sorrow at the degeneracy, in the Fine Arts, of a race, who have left us such marvelous and imperishable monuments of their ingenuity and artistic refinement, centuries before the wave of civilization had reached our Western shores.

The prevailing fashion, among the mass of the population, in their dwelling-houses, is a substantial and massive residence, built either of stone or brick, with lime mortar, the roofs generally terraced over with bricks, about four inches square. They are often built in a square, with an open, interior court, covered with tiles. Cut stone is rarely used in private dwellings, but often met with in Pagodas, Serais or Traveler's Houses, and other public buildings. It is too expensive to be used, to any extent, in what are there called Public Works, or those under the English Government, except as a facing to brick or rubble. Brickwork is the most general; but good examples of this are very scarce, indeed, owing to the custom of plastering all walls, both on the inside and outside, giving encouragement, both to the manufacture of bad bricks, and to careless workmen, the native bricklayers merely looking out to carry up the wall tolerably square; but not troubling themselves about the "bond" at all. Among the middling classes, the most common mode of building is with brick in clay, instead of in mortar; and this is even the case with some of the largest houses in such large cities as Madras, to save expense. It is by no means deficient in strength; but the great objection to it is the ready passage into the

roof, which the mud affords to white ants, the pest of the country.

In the still poorer class, and, as a general rule, in the villages throughout the interior, the walls of the huts or hovels are made entirely with mud, or rather a mixture of clay and sand, tempered to a stiff paste. The roofs most generally in use are the terraced, the "couple" with flat tiles, thatched, and arched. Tiled roofs are more common than any other, owing to their durability and cheapness.

Of late years—under the rule of the English Government, and especially since the country has been more directly under its charge—there have been a great number of very fine and elegant buildings erected, such as Churches, Court Houses, and some few private dwellings. But, still—owing to the climate, which of necessity controls the style, rendering many modifications requisite; and also the great lack of skilled artificers, the supply of such being al-

together derived from among the natives themselves—there are no edifices which can in any way compare in elegance and beauty with those of Western lands.

We have now briefly brought down the History of HINDOO ARCHITECTURE to the present day, having been obliged—through fear of overtaxing the patience of the reader with too many dry details—to omit much of which we might have made mention. The subject is one of deep interest to all who take any pleasure in diving into the records of past ages; and endeavoring—through the medium of the grand and stately monuments, which are to be found scattered all over the globe—to glean information and knowledge regarding races now passed away forever, but which, in their day, were undoubtedly very far advanced in civilization and refinement, and their constant accompaniments, art and skill.

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING.

No. 2.

LANDSCAPE GARDENING, as applied to the laying out of grounds surrounding private residences, or public buildings, is divided into two principal styles, viz., the Geometrical and the Natural. Each of these species has synonyms and varieties. Thus, under the Geometric may be placed the "Formal," "Architectural," "Roman," and "Ancient." There are, also, the Italian, French and Dutch schools of this style. The Natural similarly includes the terms "Modern," "Irregular," "Mixed," "English," "Gardenesque," and "Graceful." Writers on this subject generally include a third style, termed the "Picturesque;" but we do not recognize this, as a style capable of being defined into rules of practical application. Were we to ven-

ture to suggest a third, we would term it the American Style, which would consist of a mixture of the other two, for most of our artificial scenery partakes of both, and very justly. Although it has become somewhat popular to decry the beauties of the Geometric Style, yet it will invariably be found, that the artist will adopt so much of both styles, as is consistent with his subject. A slight reflection will lead to a conviction of the propriety of this course, when we consider that the aim of the landscape gardener is to unite the regularity of architecture with the varied and flowing lines of Nature. It may be well to remark, that we here use these terms in a general sense. Every person is aware that the details of architecture are rich in irregularities and flowing

lines; while, on the other hand, the highest effects of regular symmetry are to be found in the outlines of natural objects.

The Geometrical Style abounds in straight lines, meeting principally at right angles; the flower compartments forming some portion of a circle, or parallelogram, joining into each other, with perfect symmetry. It, also, deals largely with architectural ornaments; such as terrace walls, balustrades, vases, statuary, fountains, flights of steps and stone pediments.

This style is well fitted for the immediate production of grand effects. Hence, in early stages of society, and in countries abounding with the irregular natural forms of uncultivated scenery, distinction is at once imparted, by introducing perfectly level, or regularly sloping surfaces of ground; trees planted at measured distances apart; and ornamental lakes and ponds, bounded by straight, canal-like lines, so as to leave no chance of mistaking any portion of the scene as having been the result of unassisted natural arrangement; but unmistakably to convey the impression of a display of wealth and refinement; and indicate ownership, by distinguishing the country residence from the natural and unenclosed rude scenery of the neighborhood.

As wealth increased, so also increased the desire for its ostentatious display; and what was perfectly appropriate, and in good keeping, degenerated into unmeaning and grotesque absurdities.

These extravagancies were carried to extremes, in Europe, about the beginning of the last century. In an essay on "Modern Taste in Gardening," by Horace Walpole, the author remarks, "The compass and square were of more use in plantations, than the nurseryman. The measured walk, the quincunx and the etoile, imposed their unsatisfying sameness on every garden. Trees were headed; and, their sides pared away, many groves seem green chests

set upon poles. Seats of marble, arbors and summer-houses, terminated every vista; and symmetry, even where the space was too large to permit its being remarked at one view, was so essential that, as Pope observed

—'each alley has a brother;
And half the platform just reflects the other.'

Knots of flowers were more defensibly subjected to the same regularity. In the garden of Marshal de Biron, at Paris, consisting of fourteen acres, every walk is buttoned on each side by lines of flower-pots, which succeed in their seasons. When I saw it, there were nine thousand pots of Asters. But the ornament whose merit soonest fades, is the hermitage, or scenes adapted to contemplation. It is almost comic to set aside a quarter in one's garden to be melancholy in."

Sir William Temple, in his essays, gives a very full description of this style of gardening at his time. He advises thus: "The garden is best to be square, encompassed with a stately arched hedge; the arches to be upon carpenter's work; over every arch a little belly, enough to receive a cage of birds; and over every space between the arches, some other little figure, with broad plates of glass, colored and gilt, for the sun to play upon."

This usurpation of false taste attracted the attention of various writers, such as Addison, Knight, Pope and others of lesser note. The former, in his criticism on Milton's *Paradise*, in the *Spectator*, made a great impression by his remarks upon the poet's description of the Garden of Eden. Pope, in his *Moral Essays* on "The Vanity of Expense in People of Wealth and Quality, and the Abuse of the word Taste," describes the "false taste of magnificence" in the following lines:

"At Timon's villa let us pass a day,
Where all cry out, 'What sums are thrown away!'
So proud, so grand: of that stupendous air,
Soft and agreeable come never there."

Greatness, with Timon, dwells in such a draught,
 As brings all Broddignag before your thought.
 To compass this, his building is a town,
 His pond an ocean, his parterre a down:
 Who, but must laugh, the master when he sees,
 A puny insect, shivering at a breeze!
 Lo, what huge heaps of littleness around!
 The whole, a labored quarry, above ground.
 Two cupids squirt before: a lake behind
 Improves the keenness of the northern wind.
 His gardens next your admiration call;
 On every side you look, behold the wall!
 No pleasing intricacies intervene,
 No artful wildness to perplex the scene:
 Grove nods at grove, each alley has a brother;
 And half the platform just reflects the other.
 The suffering eye inverted Nature sees;
 Trees cut to statues, statues thick as trees;
 With here a fountain, never to be played;
 And there a summer-house that knows no shade;
 Here Amphitrite sails through myrtle bowers;
 There gladiators fight, or die in flowers;
 Unwatered, see the drooping sea-horse mourn;
 And swallows roost in Nilus' dusty urn."

Even in the 16th century, Lord Bacon, in his essays, indicates his disapproval of the extreme formality prevalent in the decoration of gardens; and gives a very accurate description of the Natural style. For instance, out of thirty acres, which he allots for the whole of his pleasure-ground, he selects the first four for a lawn, without any intervention of tree or parterre; because "nothing is more pleasant to the eye, than green grass, kept nicely shorn. And as for the making of knots and figures, with diverse colored earths, that they may lie under the windows of the house, on that side which the garden stands, they be but toys. You may see as good sights many times on tarts. I do not like images cut in juniper or other garden stuff; they are for children."

It is probable, that the keen ridicule of Pope, in the 175d Guardian, published in 1713, went further towards arresting the taste for clipping plants, than that of any other writer. After giving his translation of Homer's description of the gardens of Alcinous; and descanting upon their simplicity and natural beauties, he laments, that the modern practice is to recede from nature; and run into sculpture; and is better pleased to have trees in the most awkward figures of men and animals, than in the

most regular of their own. But, for the benefit of all his loving countrymen, of this curious taste, he publishes the catalogue of a virtuoso gardener, who has arrived at great perfection in this art; who cuts family pieces of men, women, and children, so that ladies may have their own effigies in myrtle, and their husbands in hornbeam; and who never fails, when he shows his garden, to repeat that passage in the Psalms, "Thy wife shall be as the fruitful vine, and thy children as olive branches round thy table." He then proceeds with the catalogue, as follows:

"Adam and Eve in yew; Adam a little shattered by the fall of the tree of knowledge in the great storm: Eve and the serpent very flourishing.

The tower of Babel, not yet finished.

St. George in boxwood: his arm scarce long enough; but will be in a condition to stick the dragon by next April.

A green dragon of the same, with a tail of ground-ivy for the present. N. B. These two not to be sold separately.

Edward the Black Prince, in cypress.

A laurestine bear, in blossom, with a juniper hunter, in berries.

A pair of giants, stunted, to be sold cheap.

An old maid of honor, in wormwood.

A topping Ben Johnson, in laurel.

Divers eminent modern poets in bays, somewhat blighted, to be disposed of, a pennyworth.

A quickset hog, shot up into a porcupine, by its being forgot a week in rainy weather.

A lavender pig, with sage growing in his belly.

Noah's ark, in holly, standing on the mount; the ribs a little damaged for want of water."

The most celebrated artist in Geometrical gardening was *André le Notre*, a French architect, whose rural designs and highly-wrought, fanciful decorations

attracted the notice of Louis XIV. This king made *Le Notre* his Controller-General of Buildings and Director of Gardens; and loaded him with presents and honors. His greatest production was the gardens of Versailles, which were, according to a contemporary, "the sum of every thing that has been done in gardening." He dazzled all Europe by the grand scale and sumptuous cost of his designs; and his style and manner were generally adopted. It does not appear, however, that his manner was greatly different from what had previously been displayed, in both France and Italy; his principal originality residing in the great scale and the still greater expense of his plans.

The result of these excesses caused a reaction, not less opposed to good taste. Towards the close of the last century, this reaction was at its height. Many noble terraces and other appropriate architectural features were destroyed; and replaced by undulating surfaces and serpentine walks. The painted statuary of shepherds and shepherdesses, with their flocks of marble sheep, scattered about the lawn; trees trimmed into the forms of court ladies; the multitude of petty terraces, endless archways, and countless steps, which led Walpole to laugh at people "walking up and down stairs in the open air"—were all swept away. A straight line was abhorred; zig-zag walks were introduced, on all occasions; "so crooked, that you could put one foot on zig and the other on zag;" winding paths circulated around buildings; and the arrangement of grounds was the same, whether in close proximity to, or distant from the house, making no difference, as was said, "between the habitation of man and that of sheep." Any thing like an artistic connection, between the house and grounds, was totally overlooked: the former stood like a picture, without a frame, surrounded with nothing, but

"Shaven lawns, that far around it creep,
In one eternal, undulating sleep."

All kinds of reform are ever liable to excess of innovation; and that of placing a palace in the middle of a grass field is quite as ridiculous an extreme, as ever was perpetrated by the patrons of Pope's virtuoso gardener. Mankind are ever prone to step from one extreme to another. The serpentine was now to be considered the true line of beauty; and it prevailed in every thing, whether in road, canal, walk or fence, until it came to be considered, as insipid and monotonous, as the straight line had previously appeared to be. Neither were criticisms wanting. In a poem entitled "The Landscape," the author complains of the

"Prim gravel walks, through which we winding go,
In endless serpentine, that nothing show,
Till, tired, I ask, 'Why this eternal round?'
And the pert guide replies, '*This pleasure-ground.*'"

By way of retaliation, the author of these rather severe lines was dubbed "a Grub street poet, whose only garden was the pot of mint in his window."

This divergence from the exaggerated geometrical system was commenced in England: hence, it is frequently designated as the "English" style. It, however, gradually became fashionable in France, as well as in other European countries; and almost every chateau, or villa, of importance had its "*jardin Anglais*." Even quite recently a writer remarks, "When I was last in Paris, I went to see a house, which was advertised, among other attractions, to possess its '*jardin Anglais*.' This interesting feature I found actually existing in a back court of some sixty feet in depth; but the smallness of the space had not caused any of the main features of the *jardin Anglais* to be omitted: there was the undulating lawn and serpentine walks, the belt of Scotch firs, the winding rivulet with its rocky cascade, and the lake; also, the *forêt des Sycamores*, formed by groups of six or seven small and rather miserable specimens of that tree."

In comparing these distinct modes of decorative treatment in grounds, it is apparent, that they are both defective, in forming a complete design, if used, exclusively of each other, in connection with buildings. An excess of architectural ornament and geometrical forms is no more at variance with good taste, than are those examples, where the

above features are entirely absent. But the practice of these extremes, and the discussions they originated, along with the effect of cultivating and refining a truer taste, have made Landscape Gardening subservient to the wants of mankind, and applicable to the comforts of life and the progress of society.

WASHINGTON, D. C. W. S.

PLUMBING: WATER SUPPLY AND WASTE PIPES.

BY W. G. RHOADS.*

LET us examine this dwelling-house, pleasantly located near the centre of Philadelphia: good entrance and hall, pleasant parlor, dining-room and kitchen on first floor. We go up stairs, into the back buildings; pass through the comfortable sitting-room, and come to the bath-room containing a bath-tub with hot and cold water, and water-closet.

"Mr. Jones, this must be very convenient?"

"Yes! But we only have the use of it in the summer!"

"How so?"

"Well, the bath-room is frame, you see, projecting from the brick building; and the pipe runs up on one of the posts supporting it, where it is exposed to the weather; the hot-water pipe is also exposed, where it comes through the wall of the kitchen, to enter the bath-room. Then, the trap of the water-closet is in the floor; and, of course, freezes and bursts, the first cold weather; and, just when we begin to feel the advantage of having it in the house, we are obliged to abandon it for the winter. After patiently paying the plumber's bills, for mending leaks and thawing pipes, we turn off the water in despair, and close the entire arrangement until spring."

"Sawdust about the pipes?"

"Yes! by the cart-load; and a pleasant confidence in them is broken by a terri-

ble leak, just where we thought all was right!"

Mr. Jones has had alterations made in his back-building; old bath-room replaced by brick one; pipes run on inside of building, to prevent freezing; and branches taken from the pipes, and carried under the floor, to supply those beautiful marble-top wash-basins, a most convenient and elegant addition to the house; and then the ceiling and walls have all been replastered and walls painted. Mrs. Jones is delighted; has been thinking of nothing else for a month; Mr. Jones, returning from the store, secretly rejoicing that he has arranged for the comfort of his family, in such a complete manner, is met by Mrs. Jones:

"Oh! Mr. Jones, it is too bad; the dining-room ceiling is all stained and spoiled; and I do believe the plaster will fall down; the water has run down the walls, and ruined the beautiful paint; and we have had to take up the carpet; and it is dripping from the ceiling all over one end of the room! What shall we do? It is outrageous to have things so spoiled! Servants out of humor, and every thing goes wrong!"

Mr. Jones runs for the plumber, to see what the matter is. The plumber brings his long key, and shuts the water off in the street, thus preventing its use throughout the house. It costs too

* McCollin & Rhoads, Plumbers, 1221 Market street, Philadelphia.

much to have a stop put on each branch-pipe. The plumber thinks it very strange; the work was done carefully. He cannot understand it. But it is not very hard to understand, that the water leaking from the coupling of the cock which supplies the same beautiful marbled wash-basin should follow the pipe, and drip from it on the plastering, where it runs horizontally under the floor.

Shall I ask you, now, to look at this detail drawing of a house by one of our Philadelphia architects? The bath-room is very conveniently located near the centre of the building, and can be reached from all parts of the house, without using any apartment as an avenue of approach. The room itself is well designed for bath-tubs, water-closet, bidet, wash-basin, &c., with, perhaps, the slight difficulty of leaving 7 feet space for the tub and closet, which should have at least 8 feet, and of locating the water-closet over the centre of one of the lower rooms, thus requiring a large soil-pipe to be run nearly horizontally to—where? We look in vain for a recess in the wall, or any partition, large enough to receive the pipe, which is to carry off all the waste from the bath-room fixtures. What is to be done? Well, alter the position of the bath-tub, closet, &c., and then cut half way through a new 9-inch wall, along it, perpendicularly, down to the cellar, and thus weaken and disfigure the wall; or else, let the pipe run in some angle, and have a box contrived to cover it, hoping that the box may not be noticed.

A case has recently come under our notice, in which a brick wall, containing two vertical rows of windows, had been cut, from the cellar to the fourth story, in a line between the two tiers of windows, for the purpose of putting in a soil-pipe. The wall was so weakened and sprung by the operation—a fatal one, indeed!—that it had to be entirely rebuilt, to save the disastrous effects of its falling. Whose fault was this? the plumber's, or the architect's? Perhaps

both; but the plumber has often to bear more than his share of the blame. A little care and information on the part of the architect, concerning the usual size of pipes and the proper way to locate them, would generally obviate these difficulties in a building. Why should not a plumber find an opening or recess left to place the soil-pipe in, where a water-closet is designed, as well as a range or furnace builder find, that the architect had not forgotten, that a chimney is necessary, to carry off the smoke and gas from the fires.

In running water-pipe the effect of frost should not be forgotten. In new houses there is comparatively little danger, except in the country, as the parts of the house which contain the water-fixtures are mostly in the central portion of the building. If, however, the pipes have to run on the inside of an outside wall, the recess in which they are to be placed should be lined with boards one inch or more in thickness, and, supported against these boards, the wood being a non-conductor, the pipe is protected. The near position of a flue from a furnace; or the boxing of a set of pipes, so arranged that enough warm air can pass from below, up through the box, into a bath-room, or out of the building entirely, will accomplish the same result; but in old houses it is often very difficult to protect from the frost, without remodeling the whole water arrangement. The above plans may often be used with advantage. Buildings that are not occupied in the cold weather, should have all the pipes so placed that a waste-cock, where the water is stopped off from each part of the house, can be opened, and so clear the pipes. With this end in view, they should all grade towards the supply. Small traps should be emptied by a trap-screw, placed in a suitable part of the trap; and large traps should have a connection with the soil-pipe below the trap; and there should be an auxiliary trap, on the main drain or sewer-

pipe under ground, which would prevent the offensive air from passing into the house, while the principal traps are empty and not used. A cock should be placed at the lowest point on the circulating pipes, to clear the boiler and water-back, and be so connected with the nearest waste-pipe, that all the water may be run off, and thus save the necessity of putting in a new heating apparatus in the spring.

Particular care should be taken not to place the pipes in a position where a cold draft may reach them. Even when the apartment is above the freezing point, a pipe behind a door, where a constant draft, from the door-crack, blows upon it, will often freeze; and, in passing from one floor to another, an opening is often left around the pipes, where a cold draft constantly plays upon them. Intimately connected with the effect of cold is that of heat, or rather change of temperature, in hot-water pipes. When the pipes run perpendicularly they should be firmly fastened near the top, and be loosely hooked to the board behind them; and no hook should be driven tightly against the pipe, as rubbing caused by expanding and contracting would soon cut a hole in the pipe. When lead soil-pipes were used in place of iron—now the best and most common—they often caused trouble by the effect of expansion. Aided by the weight of the pipe, the expansion was all downward. When contracting, the strain of lifting, or dragging, the pipe back into its position weakened its upper fastening, and often parted the pipe. An iron soil-pipe fastened below as well as above, is not liable to this trouble. Where hot-water pipes run horizontally, and are fastened by iron hooks to the joists, as is often done in cellars, they quickly swag between the hooks, and are often cut into holes by dragging against the sharp edges of these supports. The most effectual way to prevent this is to have the pipes supported upon a narrow wooden shelf, hung from

the joists, just low enough to allow the supply-pipes to lie upon the shelf and clear the joists. The pipes must not be fastened to this, but simply rest upon it, and be free to expand and contract. Some simple contrivance of this nature will often save heavy expense of repairs. But in every mechanical structure accidents will occur; and it is desirable that they should do as little damage as possible; and also, that they may be easily repaired. Stop-cocks, with wastes upon all the branches from the main supply-pipes are important for this, as it enables one, who is not conversant with turning off stops under ground, to stop off quickly, by these cocks, the water supply from any part of the building, and yet not interfere with the rest. To save a little expense, it is very usual to omit the use of such stops.

To avoid danger from leaks, do not run the pipes under the floors; but let all pipes run vertically. This can be done in such a way as to give easy access to repair, at the same time, by covering the pipes in walls, stud-partitions, columns, &c., with a movable covering of wood, variously planned, according to the character of the parts wherein the pipes run. Let the pipes be so placed in the box thus formed, that water from a leak may follow the pipe into the cellar, or basement; and thus do no harm until it is detected and repaired.

To prevent the damage to ceilings and walls caused by leaks, or splashing at wash-basin, baths, butler's sinks, &c., the floors under them should be lined with thin sheet lead, forming a shallow dish, which may be connected to the nearest waste-pipe by a small lead pipe. Where it is necessary to run a supply and waste-pipe for a short distance under the floor, let a small lead-lined trough be made under them, conducting any drip-water to the nearest upright set of pipes.

The water fixtures in different parts of the house being, in this way, all supplied by pipes running vertically from

the cellar, have the advantage of a more equal distribution of water, than if the supply ran directly from one to the other; and the small increased expense of so running the pipe is well incurred, as insurance against a much larger outlay, caused by damage from accident.

Let the supply from the street run directly to the boiler, either under the cellar floor, or suitably supported upon the cellar or basement ceiling; and let the supply from the hot-water boiler be run as nearly in the same way as possible. From these run perpendicular pipes, to supply all the water conve-

niences in the house. Let all waste-pipes descend in the same way, and connect with the main drain, under the cellar, or on the outside of the house.

Place all pipes where they can be easily reached; keep the horizontal pipes in the basement; and avoid positions where pipes will be exposed to cold draughts of air.

To architects, we would say, in drawing the details of buildings, keep in view the importance of showing, upon the plans, suitable places in which to put the pipes and other water fixtures. You will thus gain business and repute.

AN AMERICAN STYLE.

THE climate of our country, if nothing else, must prompt the production of an indigenous style in architecture, the precedaneous signs of which are already discernible by the European observer. It is, as yet, in the external design of our domestic construction, that the dawn of the coming style is to be detected; and the necessities of climate have prompted its appearance in that department, as being the more intimate dominion of our human family.

In other climes, the type of style is to be found in the elevations of their public buildings. The church, the palace, the town-hall, the exchange and the theatre, are the monumental monitors to consult for a knowledge of the style, which obtains in their locality. In our country, it is far otherwise. Our architects are, at best, but mere copyists of European models, mere reproducers of other men's ideas, formed for other purposes than these we have to deal with, here, in America.

Yet the public buildings are the true representative monuments of a people's taste; and it is to them chiefly, that the American architect must, sooner or later, bend his ability to give a truthful

expression to our nationality in this, the greatest of the Fine Arts.

In the late competition for the new Post-Office, that servility of design was painfully observable; and, indeed, any one might find the original source, whence most of the transparent ideas were drawn, in the illustrations of European journals of architecture.

One, and perhaps the most truthful, reason for this state of transfer, in which the mental capacity of our architects seems to be immersed, is, that many of them have received their professional education in Europe; and are naturally inclined to retain the ideas with which their minds were imbued, rather than study out anew those problems, to make them applicable to this New World of ours.

But, if foreign architects, settling in our midst, must needs retain their native teachings, is it not the more incumbent on our American architects to break the spell, which hangs over them, and commence at once a patriotic effort to nationalize their designs?

Is there any good reason, why this effort should not be made? Are our countrymen disinclined to a change?

To all these questions we must emphatically answer, NO !

Our architects are no less inventive, than our engineers and artisans. Then, in what are we to find the reason for their apparent deficiency? Simply in the want of education. Yes, it is an undeniable fact, that the great majority of what are called "American architects" are mere constructors, whose sole effort is to attain fortune, and thus acquire position. Ignorant of all that is required to enable them to venture boldly on a new path; without the light and experience which education gives; it is not to be wondered at, that their mental faculties are enthralled by the fear of failure.

By education, we would be distinctly understood to mean an intimate knowledge of the principles of TASTE. an acquirement of that searching philosophy, which enables the mind to reason as it runs; and to hold, with unfaltering certainty, to that which it acquires. The want of such education gives rise to a habit of *whittling out fancies*, governed merely by whim, or mental caprice, which may please, or displease, the public eye, on their first appearance; but, which seldom gain the respect of the refined observer; and never retain the passing regard of the thoughtless.

Such *designers* as these are the stumbling-blocks in the way of architectural progress, and it is to be regretted, that they, as a class, are generally possessed of that business tact and assurance, which go so far with the great majority of persons in quest of talent for the erection of their intended buildings.

It is true, they look into books for ideas, and it would be well, if they were content to use what they found there; but—no—a want of that discernment which education gives, will be but too certain to lead them into the folly of tampering with what they do not understand; and thus giving to the public gaze some monstrosity, which has but

one effect; and that is, to alienate the observant portion of the community from modern art.

How is such a state of things to be remedied? By urging on the education of our students in architecture. Not drudging them, as make-shifts, in offices; but by giving them every chance to study the principles of their great profession; to grow thoroughly conversant with the anatomy of their art; to become accurately informed as to the various Styles, and the Orders involved in those Styles; to wax learned in the sciences (and they are many) which are immediately connected with architecture; and to be ever ready for the acquirement of any information, which will, even remotely, bear upon the subject to which they have devoted their lives.

Nature offers lessons, which great minds have availed themselves of. As in the simple but beautiful incident in the life of Callimachus, which gave rise to the untiring charms of the Corinthian Order. And how many of the greatest architects of ages past have stooped to cull a leaf, as a pattern for the adornment of their proudest works.

In the Smithsonian Institute, at Washington, a laudable effort was made towards the production of a National Order—if not yet time for a National Style. By borrowing the natural graces of our country's cereals, the worthy architect judiciously sought to attain the desired end. Why have not others followed his lead? Is invention a dead letter, as far as the Styles and Orders of architecture are concerned? Or, are we satisfied to remain copyists and borrowers in an age of progress?

It is not possible, that the profession will always suffer America to be, in architecture alone,

"Civitatem ignobilem atque humilem."

Let us, in our day, initiate the progress we all desire to see. Let our leading professors come forward, as is their duty; and invite that co-operation they

are sure to receive. Let amateurs and admirers, men of means and taste, be solicited to join in the patriotic undertaking; and we cannot fail of seeing a NATIONAL ACADEMY OF AMERICAN ARCHITECTURE arise in our midst; and, once arisen, grow and flourish in its native strength.

The sanction of Congress can, no doubt, be obtained for such an institution; and the good wishes and art gifts of similar institutions in old Europe will pour in upon our laudable effort.

The subject of ARCHITECTURE requires to be popularized. It wants advocates, to urge its claims on a sympathizing nation; friends to introduce it to those, who stand ready to befriend it, but, from a want of acquaintance, are shy of approaching it voluntarily.

The wonderful progress made by our great art in London had its origin, some thirty years ago, in a very small and not very encouraging meeting of gentlemen, who then founded the INSTITUTE OF BRITISH ARCHITECTS, which has since given rise to numerous minor, but not less useful societies in that city and every other of note in Great Britain. Is not this fact worth dwelling on?

There are a few architects among us, who have shown an inclination to enter on such an enterprise; but, unfortunately, they "hide their light under a bushel;" and a very limited portion of the community, indeed, is aware, that there is in New York city an INSTITUTE OF AMERICAN ARCHITECTS.

This is not what we want. We want such an institution, as will make its existence known by its works—"a light on the hill," that all can see and recognize—a National School of Architectonic Taste, from which ideas worthy of our name shall emanate.

It is from such a source, and such a source alone, that we are to expect inventions in art worthy of us. It is there the mind is to be trained that will yet give us the first germs of a NATIONAL STYLE; and it is there that style will be

fostered and cultivated, until it shall attain that independent existence, so characteristic of this great country; and so certain to be recognized and appreciated by the world at large.

As we have already said, our DOMESTIC ARCHITECTURE, alone, shows a distinctive, or National existence. Its appearance is pleasing to Europeans; and, indeed, it has many points about it superior to the domestic architecture of Europe. But, all this may be attributed to the influence of climate alone, rather than to inventive skill *per se*. Those prominent cornices, so highly ornamented, and those *brackets*, which, while they support them, give, at the same time, such a distinctive feature of this style, as to be known to English architects, as AMERICAN BRACKETED ARCHITECTURE; those umbrageous "stoops;"* those broad and shady piazzas, all now so peculiarly our own, are some of the features, which go to make up this new style. Yet, it is the combination of them, that makes the distinctiveness, for, the features just named are, of themselves, all derived from European sources. Our climate prompted their application to our wants; and the native taste of our architects created that effect, which may now take the name of a *style*.

Is it not reasonable to ask, why the public buildings, as well as the private dwellings, of the nation are not susceptible of reformatory design?—or, in other words, Why they are not to take the impression of independence, which is the glory of our land?

Again we say, there is no reason whatever that they should not; and we would urge on the architects of the present day to step boldly forward, and present the world with an effort at least. It may not fully meet the taste of the

* Front steps—or, front steps, with side seats, and a canopy or roof. The term is Flemish, adopted in New York and "Down East." Were it English, the reason of its application would be on the "*lucus a non lucendo*" principle, because the steps do not *stoop* but *rise*.

times; but, let it be founded on sound principles at all events; and, even in a crude state, it will make its mark.

Every great invention was, at first, a weak effort; but it enlarged, and spread its suggestive influence, until at this day we look back with a certain feeling of respect and wonder on those primitive efforts whence such miracles have arisen.

ARCHITECTURE is, after all, the lasting monumental glory of a great Nation. But ITS STYLE MUST BE NATIONAL AND EXPRESSIVE; otherwise it cannot be considered that the nation has an architectural claim of its own, be its structures never so magnificent in outline, dimensions, and detail.

In fine, let American Architects cease

to transfer the designs of Europe, with all their antiquated appliances, once so useful and significant; and, *here, so absurd*. Let their designs be those drawn from the school of Nature, as she abundantly presents them in the peculiarity of flower, shrub, and tree; the sky-line of her mountains; the stately taper of her pines; the graceful growth of her palmettos; the pendant beauty of her aspens; and the thousand local lessons, which she everywhere gives.

A name as lasting as the Egyptian Pyramids awaits him, who initiates an American Style of Architecture, truly National, and worthy of our history, with its Orders all complete.

HERALDRY.

THE COMPOSITE TINCTURES:—FURS.

HAVING disposed of the SIMPLE TINCTURES, or those produced, either by a plain surface of bright metal, or a flat tint, we arrive at the COMPOSITE TINCTURES, of which the first grand division is THE FURS. These—as they explain, from partaking of both metal and color—were great favorites with the older Heralds.

It is inferrible, from the writings of all the elder practitioners of the art, though not distinctly stated by many, that *Fur must not be placed upon Fur*. This would leave the fundamental rule, in its entirety—*Metal not upon Metal; Color not upon Color; Fur not upon Fur*.

There is not a shadow of doubt that this is the original conception; as it is felt to be the true principle of the special adaptation of Heraldry to its purpose; and known as the real source of all the brilliant chromatic beauty of Armorial Bearings to uninitiated observers.

Clark* throws a little additional light

upon this general subject, by observing, that “The ancients broidered their titia “[tissue], or cloth of gold or silver, with “figures in colors of silk; and their “colored silks, on the contrary, with “gold and silver; and hence it is, that, “there is a general rule, that metal shall “never be placed upon metal, nor color “upon color.” The fact, here, is valuable; although the reasoning is defective. If the above were the rule of the ancients, it was, because, in addition to the color contrasts, that the metallic lustre best contrasted the silken, and the silken lustre, the metallic; but the *hence* does not fairly transfer the reasoning; over, to sway the minds of the pioneer heralds, who certainly arrived at their discovery of efficient color contrasts entirely independent of the ancients, or ancient tissues.

At all times, throughout the history of the art, unthinking heralds have, in a few instances, wilfully departed from this principle; but invariably to the great disadvantage of the symbols they invented. Thus, the arms of the Crusaders’ Kingdom of Jerusalem are: “*Ar-*

* Introduction to Heraldry. By Hugh Clark and Thos. Wormull. London. Printed by C. and G. Kearsley, 1794.

gent, a cross potent between four crosses coupé *Or*." This gives us gold figures charged upon a silver field, or metal upon metal. These were the arms purposely devised by the heralds against the rule of blazon for Godfrey of Bouillon, King of Jerusalem, from A. D. 1099 to 1100, in consideration of his distinguished valor, virtue, and piety, in order that, should future times ask, Why metal upon metal? the answer—on account of his unusual merit in all respects—might redound to the credit of Godfrey. Yet it were hard to make thinking men believe, that this nearly indistinguishable, and therefore, useless ensign, for all leading and rallying purposes, was, or is, a very successful instance of even "apples of gold in pictures of silver," to say nothing of its palpable armoristic unfitness.

Kent, from a manuscript of the Rev. Mr. Bokenham, gives, as the arms of the family of *Arando*, in Spain, "*Argent*, a bordure *Or* entoyre of rests [or Clarions] *Azure*." Here is a border of *gold* to a *silver* shield. *Entoyre* means charged with eight inanimate objects, one in each of the four corners, and one on the top, each side, and bottom of the border exactly half way between every corner pair. These *blue* figures, however, relieve both metals; so that this is not, like the preceding, a violent case.

For armorial bearings of the kind in question, the French use the term, *Pour enquirer*, meaning, *to inquire*, or, *for inquiry*, whence, in English, they are called by Nisbet and others, Arms of Inquiry. The French, also, use the word, *Cousu*, to signify a piece of another Color or Metal placed upon an Ordinary in defiance of the rule, and, therefore, not appropriately upon the field, but in the nature of a thing *sewed* on.

Even as keen and judicious an author as Kent, confessedly abridging Guilim, dissents from the rule, because instances of metal on metal, color on color, can be produced from amongst the arms

of ancient and noble families, and also, because, "Our neighbors, the French, do often professedly break through this pretended rule, by virtue of their two terms, *Cousu* and *Pour enquirer*." Allowing all this, the exception proves the rule; and all these instances—however complacently produced by their inventors, or adduced by their admirers—are assuredly armoristic failures. Before controverting, it is always best to see, whether we are not committing modern foolishness in questioning ancient wisdom. In this, as in many other matters, it happens that the intermediate is corrupt, while the primary is pure.

The *FURS* are *Ermine*; *Counter-Ermine*, or *Ermines*; *Erminois*; *Erminites*; *Pean*; *Vair*; *Counter-Vair*; *Vair-in-Point*; *Vair-in-Pale*; *Vair*, ancient; *Potent*; *Counter-Potent*, or, *Potent-Counter-Potent*; "*Potent-in-Point*, for *Meirre*, *Vairy-Cuppy*, or *Vairy-Tassy*;" and *Potent-in-Pale*. Of these, *POTENT-IN-POINT* is our synonyme for the *Fur* indifferently signified by either of the three terms following it, by way of help to the memory,—as, in the disposition and tincturing of the figures, it exactly corresponds with *Vair-in-Point*; and *POTENT-IN-PALE* is a suggestion of the writer's, to round up the list, consisting, as it does, of *POTENT* figures arranged and colored in the same manner as the *VAIR* figures of *Vair-in-Pale*. This will make no confusion, as it cannot hitherto have occurred in any coat.

The elder Armorists are not entirely uniform, in the appropriation of the above long-settled terms to the figures and tinctures represented. This, probably, arises from the fact, that, without specially referring to the official rolls at hand, they depended on their *memory of the figures*. We have consulted many authorities, choosing between them in all cases of doubt; and feel assured, that our assignment of the figures to the technical name will meet the approbation of those best acquainted with the subject. Where old authorities differ,

we have, of course, the option of choice between them; and if, in transmitting old coats, we are only careful to draw the bearings, as they are found, whether, in our opinion, erroneously described, or not, no harm can possibly accrue.

As in the case of the Metals and the Colors, the *Furs* alone are used as Coats-of-Arms.

ERMINE.—The Dukes of *Bretagne*, in France, till the time of Charles the Eighth, 1491, bore simply, *Ermine*.—[Vallemont; and René François, in his Essays.] Heylin, in "The Help to English History," sets down the same coat for *Arthur Fergant*, Duke of *Bretagne* and *Richmond*; temp. William I.; but Brooke makes Fergant's arms, "Checky Or and Azure, a *Canton* [i. e., a little square, filling the dexter chief corner] *Ermine*."

ERMINES.—This, on the authority of Kent, was borne, alone, by a very good French family, named *Mignon*.

VAIR, simply, was the COAT-ARMOR of the ancient English family of *Beauchamp* of *Hacche*. *Vairé*, *Topaz*, and *Ruby*, was the coat assumed by *William de Ferrers*, Earl Ferrars and Derby, his ancestors having borne the *Horse-Shoes*. The same coat, i. e., *Vairé*, *Or* and *Gules*, is borne by the two French families, *Alban* and *Senecai*. *Vairé*, *Or* and *Sable*, are the Armorial Bearings of the name *Gourvinet* in France. *Vairé*, *Or* and *Azure*, by the family of *Rochford*. *Vairé*, *Argent* and *Gules*, is the blazon of the two English families of *Colworpe* and *Bohun*; and Kent says he finds the same coat attributed to the name of *Ferrars* of *Farnworth*, with an *Unicorn*, passant, *Ermine* for the crest. Finally, a very elegant coat, we have, *Vairé*, *Ermine* and *Gules* [i. e., a simple ermine spot to each alternate shieldlet] for the Armorial Ensigns of *Gresley* of *Drakelow*, county Derby, England.

ERMINE, armorially, is composed of white fur, upon which are sewed black

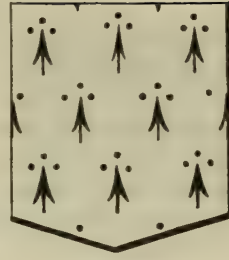
tufts or spots, in regularly intersecting diagonal rows, or, as it may be better understood by some, in *quincunx* fashion. Each of these spots is composed of four

distinct objects, nearly approximating, so that, to all intents, they constitute one. If on a large scale, and elaborately painted, the upper spot is a little tuft of fur, with its single point upward; the lower spot is a large tuft with five points, the centre and longest one directed vertically downwards, and the two shorter on each side, exactly corresponding to each other in length, thrown gradually outwards in similar concave curves, each also terminating in a point.

Two little tufts—of the same size with the upper one, arranged with single points outwards, one on either side of the place where the upper and lower tufts approach each other nearest—complete the *Ermine* spot, as in the annexed cut. In ordinarily well-engraved or painted coats, of the size of the main shields in this article, the three upper tufts are formed as simple round dots; and the five points are made three. In actual ermine, composed as a fur, to wear upon the person, or, as represented in the doublings, or linings, of the mantles displayed around finished coats-of-arms, each black spot is a single tuft with one point.

If there are less than ten [some writers say less than nine] of the technical spots upon the field, it is necessary to specify the number; but if that exact number, or more appear, it is immaterial to give the number, as they are all alike considered Ermine.

Ermine is invariably *Argent* and *Sa-*



ble, that is, a *White* fur with *Black* spots; not that the skins are naturally so, but from the practice of the furriers beautifying the *white furs*—designed as collars, capes, cuffs, or linings for the garments of their distinguished customers—with a few bits of the *black tails* of those creatures, whose peltries furnished the main portion.

Colombiere says, the Latins call the animal, from which the Ermine is taken, a Water Rat, because it lives either on land or in water; and that he, himself, has seen many of them in Brittany, living generally in forests near the sea, lakes, or rivers.

Upton calls this beast, in Latin, *Mus-tela*; remarks that it changes its color, and that it is found in Brittany, as above; but Leigh makes it a native of Armenia.

Gibbon, blazoning in Latin the Coat of Whetnal, which is, *Vert*, a bend *Ermine*, expresses it: *Gerentis in clypeo viridi Baltheum humeralem muris Armenij vellere impressum*. And again, varying from himself, thus: *Muris Armenij seu Pontici maculis respersum, sive interstinctum*.

ERMINES, OR COUNTER-ERMINE—

is the reverse of Ermine, that is, the shape and disposition of the spots being exactly the same as Ermine. *Ermynes*



is composed of a *Black fur* with *White tufts* or spots; all the other particulars being the same with Ermine.

Coates ridicules the name *Ermynes*, say-

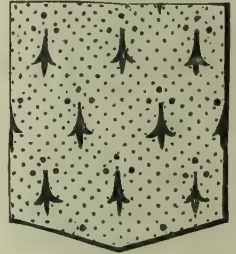
ing, Whence the English heralds, who so call it, had such a conceit, no man can tell, for our [English] heraldry is from the French, who use no such word; but call this *Black* powdered with *White*,

COUNTER-ERMINÉE, which is very proper, as denoting the Counter or Reverse of Ermine, the latter being *White* powdered with *Black*.

ERMINOIS—

has the same figures, disposed in the same way, with Ermine and Counter-Ermine; but

the fur is *Yellow* or *Gold*, powdered with *Black*. The French say of such a Field, that it is "*D'Or, semée d'Hermes de Sable*," or *Gold sprinkled with Ermine spots*.



Coates confesses his inability to find the origin of the term *Erminois*, and proceeds to ask the most strenuous of his countrymen, Whether the French method, as it is intelligible, is not preferable to the English; and also, Whether the English heralds, with their word *Erminois* could reasonably expect to be understood by armorists using another language, or, in a foreign country, as understood by home blazoners, adding, that reason looks to the full as well in England as anywhere.

ERMINITES—

is the term applied to a *White* fur, sprinkled with *Black* tufts or spots, exactly of the same figures, and in the same manner, as described for *Ermine*, *Ermynes*, and *Erminois*, but every large tuft is represented with a slender tuftlet of *Red* on each side, making five points to the large tuft, instead of three, as usually given in Ermine.

Coates remarks, that the proper signification of *Erminites* must be *little*



Ermines, as the word is a diminutive; but you must understand, if you can, that this means quite another thing, namely: A *White* field powdered with *Black*; but, then, every such spot hath a little *Red* hair on each.

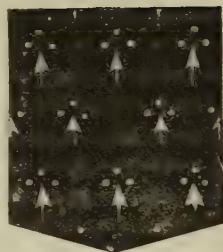
Others mention that this *Red* hair consists in a separate portion of the general tuft parted off on each side.

PEAN—

in markings and their disposition, corresponds exactly with *Ermine*, *Ermines*,

and *Erminois*; but it is a *Black* fur, strewed with *Gold* or *Yellow* tufts or spots.

This Fur is not mentioned at all by Coates, a very singular omission in so elaborate and exhaustive a writer, as it seems, from heraldic authors of repute, to be well established.



PORCELAIN, GLASS, AND POTTERY.

BY CHARLES P. WILLIAMS.*

THE HISTORY OF THE ORIGIN OF PORCELAIN MANUFACTURE IN EUROPE adds another to the many instances of important discoveries originating from Alchemical Researches. Much that is valuable in the most exact of Physical Sciences—Chemistry—and in many of its applications to the useful in life was found in the waifs of by-paths from the main traveled road, over which so many passed in pursuit of the ignes fatui of the Philosopher's Stone and the Elixir of Life, blundered upon, and blindly followed, by some dreamer, till the crude, corroded nodules, perhaps, picked up for the hammers of emergency, suddenly breaking in the hand, display sparkling crystals of pure Science and true practical knowledge.

An apothecary's assistant at Berlin, John Frederick Bottcher by name, being suspected of alchemy, fled thence to Dresden, where the Elector, believing him possessed of the secret of the transmutation of base metals, and their conversion into gold, placed him in the laboratory, and under the close surveillance of Tschirnhaus, who was seeking for the Universal Medicine. It was

here, that the contents of some crucibles, prepared for alchemical purposes, unexpectedly assumed the appearance of Oriental Porcelain, which had been introduced into Europe from China, after the voyage of the Portuguese navigators around the Cape of Good Hope; and which was even then much prized by, and only in possession of the wealthy. Augustus II. appreciated the importance of the discovery of Bottcher; and removed him to the Castle of Albrechtsburg, at Meissen, where, with an officer as a constant attendant, he was provided with every comfort and luxury; and with every facility for his research, till, in 1709, the true white porcelain was produced; and, in the succeeding year, the great manufactory at Meissen was established, with Bottcher as director.

The secret thus discovered was carefully and jealously guarded; strict injunctions, with respect to secrecy, were enjoined upon the workmen. The establishment in the castle was a complete fortress; the portcullis raised neither day nor night; and no stranger allowed to enter, whatever the pretence. The chief inspector and all under him, were

* Analytical Chemist, No. 3045 Chestnut street, Philadelphia.

sworn to the closest silence, with the punishment of imprisonment for life attached, for divulging aught connected with the manufacture. Everywhere around the establishment was the warning motto: "*Be Secret until Death.*"

Despite these injunctions and precautions; and even before Bottcher's death, which occurred in 1719, one of the foremen escaped from the manufactory; and, going to Vienna, was cordially received by Charles VI.; and granted the exclusive privilege of manufacture for twenty-five years. Thence, the process—no longer a secret one—spread over Europe; and the art, relieved from its cramping restrictions—and with the incentive of rivalry among various manufacturers—assumed its proper importance; and made its products available to all classes.

Of the HISTORY OF THE ORIGIN OF GLASS we have less positive knowledge. The story of Pliny is familiar to us all. Some Phœnician merchants, landing, near the mouth of the Belus, from a vessel loaded with *native soda* (then called *nitre*), used some blocks of their cargo, to support their kettle over the fire, kindled on the sand of the shore, and were surprised to see a vitreous substance produced by the union of the sand and soda. They might well have been surprised, for, in the light of modern chemical research, we may feel assured, that *no heat thus produced would be sufficient to bring about that intimate chemical union between SILICA and SODA necessary to the production of GLASS.*

This currently received opinion, therefore, done away, we have no other to supply its place; and must rest content with the knowledge, that, whatever the origin of its formation, glass was extensively manufactured at Sidon and Alexandria, as told by both Strabo and Pliny, and that the knowledge of its production came thence to VENICE, whence it spread into Bohemia, France, England, and Sweden.

With the decline of Venetian com-

merce, and consequent decay of the power of the Commonwealth, its glass manufactories, which had indeed "done the State some service," ceased to hold their importance; and the BOHEMIANS became the leading producers of this valuable commodity. In respect, both to the quality of their material for many purposes, and the excellence of finish of their products, this people are without competitors, as will witness the chemical laboratories of the world, wherein Bohemian glass has become the *sine qua non* of exact research and experiment.

The Origin of POTTERY is coëval with the origin of the race. It was the branch of the Ceramic or Plastic Art first followed. While it was the child of necessity, its brother, the Porcelain Manufacture, was born of luxury. The potter's art was an ennobling and honorable profession. "And Jokim, and the men of Chozeba, and Joash, and Saraph, who had dominion in Moab, and Jashubilehem," were the potters, "and those that dwelt among plants and hedges: there they dwelt with the king for his work."* How many of the most beautiful metaphors of Scripture are drawn from it, symbolizing the Almighty's power over the hearts of men; and how has it always been an object of royal patronage—nay!—royalty itself has not disdained its practice. Diodorus Siculus tells us, that when Agathocles, King of Sicily, was showing his vases of gold to his friends, he said to them, "These vases have been made, after the earthen vases which I turned formerly, when a potter." None the less is it associated with the names of characters celebrated in history. What romance is clustered around the career of Bernard Pallisy, and that of the unfortunate Jacquelin of Hainault.

Though so ancient in its origin, its manufacture, in Europe, was lost in the Dark Ages succeeding the subversion

* 1 Chronicles iv. 22, 23.

of the Western Empire. It was revived, however, in Spain through the Moors by the production of beautiful tiles of enameled earthenware, called by the Spaniards "Azulejo;"* and spread thence into Italy, in "Umbrian Ware," or "Majolica;" thence into France, Germany, Holland; and, finally, into England, where, under Wedgwood, it made greater progress and attained its greatest importance, as a branch of the Useful Arts.

In this immethodical and desultory sketch of the histories of the Ceramic and Vitreous Arts, we have been guided in our order of treatment by the relative general commercial values of the wares, rather than by any thing more philosophical. From a chemical standpoint, they have much in common; and we may properly place *Glass and Pottery at the ends of the series, Porcelain* holding an *intermediate position*, and possessing properties in common with, and allying it to both.

There are two chemical elements—sometimes designated by chemists by the name of Glass-Producers or Hyalogens, whose union with oxygen produces acids, which, at a high temperature, have the power of uniting with various salifiable bases; and to the products thus formed is given the name of *glasses*. Of these two—which are called Silicon and Boron, and their oxygen compounds Silicic and Boracic acids—the former, alone, is used in practice. It is abundant everywhere, and is an old acquaintance of us all, merely under other names. We style it variously Quartz, Sand, Flint, Agate, Jasper, or otherwise, according to the conditions under which we observe it. The salifiable bases are potash, soda, lime, baryta, magnesia, alumina and the oxides of iron and manganese, variously used and proportioned, according to the quality of the glass desired, and with a view to the purposes to which it is to be applied.

These bases and silicic acid, in the high heat of the glass-pot, unite to form artificial compounds, which are called silicates, analogous in composition to those abundantly distributed natural compounds, which form many of the most beautiful objects in the mineralogist's collection. The artificial substance differs, in one essential particular, from its native relatives, for, while these last are crystalline in structure, glass is what is scientifically termed amorphous, that is to say, is non-crystalline. "It bears," says Dr. Knapp, "the same relation to a natural silicate of like composition, that melted sugar does to ordinary crystallized sugar." This feature of structure is the cause of the brittleness, since the melted mass, being rapidly cooled, has no opportunity to allow its particles to carry out their natural intention and desire of crystallizing. On the contrary, they are forced to remain in the relative positions in which they were placed during working; and, consequently, there is such a want of uniformity, in attraction of particle for particle, that the slightest impulse, from without, frequently will subvert the cohesive force and cause the mass to break. The familiar philosophical toys, known as "Prince Rupert's Drops" and "Bologna Flasks," beautifully illustrate this.

To obviate this evil, the glass-maker has resort to the process, that we call *annealing*, which he conducts, by exposing his wares, or products, to heat just sufficient to soften the glass; and allows it gradually and slowly to cool. If, however, the mass is too rapidly cooled, the vitreous, amorphous structure of the glass is destroyed; and the crystalline structure established, producing a remarkable change in properties; the mass losing its lustre; and, in a great measure, its transparency; and resembling, in so many respects, porcelain, that it is called *Reamur's Porcelain*.

Artistic talent has found a wide field

* Marryat's History of Pottery, London, 1837.

for its employment, in the discovery and application of the fact, that many heavy metallic oxides will combine with silicic acid; and that the salts, then produced, can be united, in all proportions, with the ordinary colorless glass, giving rise to a variety of shades and colors and producing the ordinary colored glasses, the *glass-pastes*, for jewelers, and the pigments for *bona fide* Glass-Painting.

In the ordinary colored glasses, the yellow is produced by antimony, or by a mixture of antimony, minium and oxide of iron; but the intense red is imparted by the small amount of the sub-oxide of copper, as recently discovered and pressed into service. It was to this, that the glass-paste, found at the Villa of Tiberias, on the Island of Capri, owed its brilliant color, so that its use must have been known at a very early period. The art was, for a long time, a lost one—or, at least, if preserved in books and manuscripts, entirely unpractised—and it is only within a few years, that it has been rediscovered and revived. An equally brilliant red is produced by gold. Greens are obtained by protoxide of iron, as in the ordinary bottle glass, and oxide of copper. A perfect imitation of the emerald is obtained by a mixture of the oxides of copper and chromium, whilst the blue glass is colored by oxide of cobalt.

It may strike the reader as somewhat incongruous, that colored glass should be mentioned as of recent origin; and as having been one of the fruits of modern chemical research, when it is known to have existed, in the windows of churches, as early as the 3d century; and when the most beautiful specimen known, the celebrated Portland Vase, was found and removed from the tomb of Alexander Severus, who died, A. D. 235. From the total unacquaintance of the ancients with a knowledge of the chemistry of the heavy metals, there is but the one conclusion to draw, that such productions were the result of

chance; and that the same results could not be indefinitely repeated, as at the present time. Knox made the observation, that all metals, with the exception of platinum, are dissolved, as such, by melting glass; and that they impart color to it, if the heat is continued for a length of time, sufficient to bring about combination. Chance observations of this kind have unquestionably been made in the glass-houses.

Among the most interesting of the glasses are the white and the enamels, which are produced by oxide of tin, antimonious oxide, chloride of silver, and phosphate of lime or bone ashes—the last producing a beautiful opalescent or milky white.

In our own city, the "American Hot Cast Porcelain Co." are now manufacturing a material, resembling in appearance, the ordinary French China; and susceptible, not only of all the uses to which that substance is applied; but, also, of all the manipulations of the ordinary glasses. The translucency, or, rather, semi-translucency, of this substance is due mainly to oxide of zinc, of which it contains, according to a recent analysis, about eight per cent.

From the white opaque glasses, the transition is natural and easy into the highest division of the Ceramic Art, that of Porcelain Manufacture. The popular title of this substance denotes the origin of the art, as do the names of the substances employed in its production. From that mysterious and remarkable people, the Chinese, we get the words Kaolin and Petuntse, the two ingredients entering into the composition of the true Porcelain, the first being the infusible ingredient, or clay, the second, the fusible feldspar, or petrosilex.* Our word, itself, is said to be

* "Kao-ling is the name of a mountain situated to the east of the King-te-chin. The Pe-tun (white paste) of pulverized petro-silex, when formed into bricks (tse), is called Pe-tun-tse, *i. e.* bricks of white paste. Bricks are also formed of colored paste, hoang-tun-tse, *i. e.*, bricks of yellow paste, etc."—Marryat, *loc. cit.*, page 179.

from the Portuguese; Porcellana—signifying a “little pig,” and, afterwards, a cup—having been applied to the cowrie shell, the inner coat of which furnished a means for the early Portuguese navigators to convey to their countrymen an idea of the beautiful ware of China. This is most probably the origin of the word Porcelain, though it may be, that the term was adopted and applied from the prevalent idea, encouraged by the Chinese themselves, that the material was composed of sea and egg shells, which had been buried in the earth for eighty or a hundred years.* That this was currently held is evident from the old writers. Harte says,

“True fame, like Porcelain earth, for years must lay
Bury'd and mixed with elemental clay.”

The Confessor.

Guido Pancerolli, quoted in Marryat's above-cited interesting work, says: “In former ages Porcelains were never seen. Now there are a certain mass, composed of gypsum, bruised eggs, the shell of the marine locust, and other substances; and this, being well tempered and thickened, is hidden under ground, in a secret place, which the father points out to his children; for, as respects others, he does not wish them to know it. And there it remains hidden for eighty years; at the end of which time, the children, or grandchildren, dig it out; and when it has been again reduced to a fluid state, and made fit for working up, they form of it precious vessels, very beautiful to look at, quite transparent, and wrought of any form, or color, which those workmen think proper. The remarkable virtue of these vessels is this, that if any poisonous thing have been put into them they immediately break.”

The Kaolin, or Porcelain earth, is composed of our old acquaintance, silicic acid, in combination with alumina

and water. Feldspar, or petro-silex, also contains the same silica and alumina, together with potash, soda and lime. Kaolin, when moulded and put into the furnace, would result in the production of an opaque mass, the ordinary pottery. The feldspar, called the flux, however, in the furnace, removes this opacity, and produces, by its dissemination through the infusible clay, a translucent material, which exhibits, under the microscope, both components, the flux interpenetrating the clay. This is why we have placed Porcelain intermediate with glass—the transparent, non-crystalline silicates and the common pottery made of clay alone.

The proper mixture of clay and flux, when once fired or burned, is still not complete Porcelain or China. Its name, in the art, is *biscuit*, which requires dipping in the “glaze,” composed of broken porcelain, Kaolin and gypsum; and a second burning. This is the most delicate and important stage in the manufacture, for the success of the product depends upon having the glaze, so compounded, that it will not be too fusible nor too difficult of fusion. In the first case, the glaze becomes fluid, before the paste is sufficiently baked, producing a dry, rough surface, whilst, in the last, it will not be sufficiently fluid to form a uniform surface, but will give rise to a wavy appearance. It is probable, that the ill-success of most attempts at porcelain manufacture, in this country, have resulted from want of sufficient care in the preparation of the glaze. It certainly cannot be due to a paucity of raw porcelain materials, whether of Kaolin or feldspar, for Chester county, of our State, and the neighboring Commonwealth of Delaware, as well as some of the New England and the Southern States, abound in extensive deposits of both these substances, of a quality excellently well adapted to the purposes of the porcelain manufacturer. Their exploitation serves only to supply the demands of the producers of the com-

* Dr. Johnson fancies the name derived from the French *pour-cent-années*, “for one hundred years.”

moner stoneware, together with the small amount of washed and prepared clay consumed by paper manufacturers. Fine Porcelain manufacture has failed, in the United States, from other causes than a lack of the material.

Porcelain painting is done with colored, fusible glasses having the same metallic oxides for the coloring matters, as given above for glass, applied to the subject, and subsequently burnt in, in a muffle, or furnace open at both ends.

Gilding is best done with finely divided metallic gold (such as the chemist prepares by precipitating a solution of gold by means of oxalic acid) mixed with oxide of bismuth and rubbed up with oil of turpentine, applied with a brush, and subsequently burned in, in the muffle.

The clay used at the celebrated Sèvres Works is obtained from St. Yrieux, near Limoges. That employed formerly at Meissen was carried to the factory, from Aue in the Erzgebirge [Ore Mountains], under circumstances of secrecy, which appear as ridiculous as the discovery of the deposit was singular. Bottecher's valet employed, in powdering his master's hair, a white substance, which had accidentally been discovered by a rich iron-master of Saxony, named John Schnorr, and sold by him, in large quantities, at the fairs of Dresden, Leipzig, and other places, for the purposes of a hair powder. Bottecher was struck with the density of the powder, found it was earthy, inquired into its origin, and, to his great joy, found, that he had discovered, at last, the material for the production of white porcelain; for his previous products had a red, jasperous appearance; and were polished by the lapidists and gilded by the goldsmiths. The Kaolin thus singularly discovered was long known under the commercial name of *Schnorr'sche Weisse Erde*—Schnorr's White Earth.

The Kaolin deposits of St. Yrieux were discovered in a no less remarkable manner; and at first, attracted attention for the purpose of furnishing their mate-

rial for a use entirely distinct from, but none the less important than, that of porcelain manufacture. The wife of a surgeon of St. Yrieux, Darnet by name, noticed the white unctuous substance, and conceived the idea, that, having excellent detersive qualities, it would serve as an abundant and cheap substitute for soap for washing purposes. The fact that numerous researches were being made, throughout France, for a supply of porcelain earth for the then newly-established works at Sèvres—the success of which had been far from encouraging—was known to the apothecary at Bordeaux, to whom Madame Darnet had carried the earth; and he, at once suspecting its nature, forwarded the sample to the chemist Macquer. The discovery at once effected a remarkable change in the Ceramic Art in France; and established the works at Sèvres on a sure foundation. Madame Darnet, was, however, forgotten, and in misery, till the year 1825, when she applied to the eminent savan, Brogniart, then at the porcelain establishment, for means of returning on foot to St. Yrieux. Louis XVIII., on being made acquainted with her circumstances, to his credit be it said, granted her a pension from the Civil List.

The origin of Kaolin is to be sought in what mineralogists call the feldspathic rocks, that is, in mineral aggregations, which contain a large amount of feldspar as a component. The disintegration of this mineral is effected through the agency of the carbonic acid dissolved in all waters which, by the play of its affinities, extracts the potash, soda, and lime from the feldspar, in the form of soluble carbonates, leaving behind the silica and alumina combined, and in a hydrated condition, with a more or less plastic nature, as the new compound is more or less mixed (mechanically) with undecomposed feldspar and the other mineral constituents of the parent rock.

The deposit at St. Yrieux yields, not

only the clay for the base of the porcelain, but the fusible material or feldspar. Those rocks containing but a small proportion of mica, yield a better clay (less fusible) than those in which this mineral preponderates. A mixture of feldspar and quartz, or the rock called by mineralogists *pegmatite*, produces, *cæteris paribus*, the best Kaolin.

The writer of this article has examined, in his professional capacity, both in the field and in the laboratory, many American Kaolins, not a few of which were fully equal to the best of the foreign; and has seen these clays tried by *reputed skilled workmen, in the production of Porcelain, always with the same result, and THAT RESULT A FAILURE.* He is satisfied that the lack of that minute and delicate attention and care, so requisite in the preparation of the *glaze*, has been the cause of the repeated ill-success of American Porcelain.

To amplify a previous paragraph, the Moors first re-established in Europe the manufacture of pottery as an art, after the knowledge of it had become in a measure lost, during the Dark Ages succeeding the subversion of the Western Empire. Throughout Spain are found numerous evidences of the perfection to which they carried the production of the finer qualities of ornamental pottery, more especially in the manufacture of the beautiful tile known still as *azulejo*. From Spain, the art passed into Italy, one of whose styles was *Majolica ware*, (a corruption of *Majorca*), and thence a knowledge of it was disseminated throughout Europe. But it soon lost its prestige and high position, the discovery of the composition of Porcelain causing that material to supersede the coarser and older earthenware proper, or pottery, and leaving for this latter no further demand, than for the commoner domestic articles. In the hands of Wedgwood, in England, the plastic art seemed destined to regain, in a measure, its pristine importance and splendor, in all its departments; yet the majority of

his wares also approximate, in physical properties, as well as chemical composition, to porcelain rather than pottery.

As the transition from glass to porcelain was a gradual one, so from the latter to pottery there is no less an easy gradation, so much so, that both WEDGEWOOD and STONE WARES—intermediate steps from porcelain to earthenware—may indiscriminately be classified either with the former, or be described as pottery. In a strict technical sense, though not in an æsthetical one, they belong to the earthenware division of the Ceramic art; for we may define this last as including all those varieties from which is absent any flux, and which, being fired at a temperature sufficiently low to prevent even a semi-fusion of its component parts, is never translucent, but always opaque, and possessed of an earthy fracture.

Potters' ware, being destined for the most ordinary purposes of domestic life, must combine in its manufacture essentialities to meet the requirements of low prices, imperviousness to liquids, and durability under changes of temperature. The first is satisfied by the wide-spread and abundant occurrence of the ordinary clays, by the use of inexpensive methods of moulding, and by burning in kilns of cheap construction, which shall consume the possible minimum of fuel. This latter condition produces a material of a light, porous structure, which, to meet the second requirement, must be coated with a thin glaze, generally of a very fusible lead glass. The third condition is satisfied by mixing or tempering the clays, when too *fat* or unctuous, with sand, or lean clays, to diminish contraction.

The porosity of unglazed earthenware is finely illustrated, and its properties utilized, in the ordinary water-coolers or cooling-jars of tropical America. A clay vessel—moulded in fanciful and, oftentimes, not ungraceful forms—baked without glaze, and filled with water, will soon be coated on its outer surface with

a thin layer of moisture, which rapidly evaporates, abstracting heat from the vessel, and from the remainder of the contained water, and reducing the temperature of the latter several degrees below that of the surrounding atmosphere. The porosity, and, consequently, the cooling effect, is greatly increased by mixing with the raw clay, organic matter, finely subdivided, which, in the baking process, being completely destroyed, leaves minute pores; or, salt being mixed, is dissolved out, by water, after the baking of the vessel.

In the mixed Spanish dialect of South America, these vessels are called *canaris*, though the knowledge of them and of their properties, is not the spontaneous growth of the exigencies of the climate, but was transmitted from the European ancestry of the people. These, themselves, derived it from the Moors, the vessels having been manufactured, from the remotest times, in warm countries. The Spanish name, *alcarazza*, is a corruption of the Moorish *Al-Karazah*. In upper Egypt, where such quantities are manufactured, and at such cheap rates, that one is scarcely used the second time, they are generally made very thin, and are perfumed by inverting them over a piece of gum mastich placed on a burning coal, itself a very ancient custom, if we are to credit Athenæus, according to whom, vases made at Coptos, and perfumed by mastich and myrrh, had the property of depriving wine of its intoxicating effects. In the interesting work of Marryat, from which we have frequently quoted, and to which we are indebted for many of our historical facts, is described the manner of transportation of these vessels, from Kenneh, in upper Egypt, to Cairo, by forming them into rafts, and sending the fragile float, with a single conductor or steersman, down the Nile—a manner of conveyance certainly cheap, but precarious, yet antique, and recommending itself, on this score, to the strong “conservative element” of the Egyptian population—for

Juvenal tells us that the Egyptian “boats were made of earthenware, and painted.”

Of WATER CONDUITS, or TUBES, the best are made by kneading together, into the form of cakes, a mixture of good plastic clay, with an impurer variety containing considerable sand, mica, and oxide of iron, and then forcing the mixture, through hollow cast-iron cylinders, into the moulds, by means of a hydrostatic press. After thus giving them their desired shape and size, they are dried in a baking-kiln; and will then, it is stated, resist a pressure of nearly one thousand pounds to the square inch—a result impossible to bring about by any of the ordinary means, without the use of the press.

DRAIN TILES, FOR AGRICULTURAL PURPOSES, are constructed on the same principle of forcing the clay, from cylinders, through the proper die-plates, attached to their lower extremities.

ROOFING-TILES were formerly moulded on a flat board, around which was nailed a rim of the desired thickness of the tile; the arched or curved form, if thought advisable, being given afterwards, by bending the flat tile around a block of wood. An improvement is also effected in the production of these, by the use of the press, as above, the product being much denser, and less liable to destruction from frost. Their durability in this latter particular is also greatly enhanced by glazing; the ordinary potter's glaze brought to the desired color by metallic oxides being used.

Wonderful alchemists are the potters and glass makers!

A few particles of sand, or a little clay, assuming, in their hands, so many forms of use and beauty,—transmuting the weather-worn, current-drifted and powdered rock into shapes to minister to man's comforts or pleasures. We may trace much of the history of the progress of the human race in the distinctive character their hands have im-

printed on the forms of the Protean elements, Silica and Alumina. We may learn from these forms the domestic manners of nations long since passed away. They tell us of times whereof we have no other records, fixing even the antiquity of man's appearance on the globe. By them we may trace the limits on the world's surface of empires great in history—of ancient Greece and her colonies—of Rome and her geographical sway—of the rule of the followers of Mahomet—all these in the Old World. While, on our own continent, the extent of the Aztec dominion is pointed out by them as clearly as though we possessed other apparently more permanent records. We find, too, in the history of the Vitreous and Ceramic Arts, some strange instances of psychological phenomena—of a mania, for the possession of their products,

absorbing minds, which the world calls great. We find Johnson strongly interested in Porcelain Manufacture; and the Elector Frederick Augustus, of Saxony, receives from Frederick William, of Prussia, twenty large vases, and recompenses him by making over to him his finest regiment of dragoons. In the time of William III., according to the Satirists, every great house in England "contained a museum of these grotesque bubbles," and a fine "lady valued her mottled-green pottery, as much as she valued her monkey, and more than she valued her husband." In the last century, even, it could be said of a great many, as is written of no less a personage than Horace Walpole,

"China's the passion of his soul,
A cup, a plate, a dish, a bowl,
Cau kindle wishes in his breast,
Inflame with joy, or break his rest."

FOUNDATIONS.

BY C. P. DWYER, ARCHITECT.

THERE is no single subject, in the entire range of an Architect's professional studies, that so intimately concerns his good name, as that of FOUNDATIONS. It calls for all his cautious investigation and certainty of calculation, for on it rests that superstructure which, in its inception, has been his pride and his hope.

How painful is the feeling, to a sensitive artistic mind, that a settlement has taken place, as too palpably displayed in the first apparent crack, or as it is too commonly, but ignorantly, termed, "check," in the masonry, or brickwork, of the walls. Such, however, is too frequently the case, in many of our large buildings; and not unfrequently communicates its mischief to the plastering of partitions and ceilings, to an unsightly degree.

To avoid this misfortune, it is neces-

sary, then, to be particularly careful in the construction of the foundations, providing against *sinking*, *spreading*, and *sliding*.

SINKING

This is, of all, the most to be guarded against, by Architects or Engineers, and too much caution cannot be exercised to prevent its occurrence.

In the first place, the ground to be built upon must be thoroughly tested, or probed, by means of borers, at many points in the proposed line of the main walls, and wherever piers are to come. The corners should have their intended localities especially examined, and thoroughly understood.

In cities, the drainage being already provided for, the action of undersapping, by subterranean lodgements of water, need not be dreaded. But, in the

country, it is otherwise; and this secret underground action must be the study of the Architect. This subject is a very interesting one, and although it must be evident to all, that such a lodgement of water is a positive source of danger to foundations, and there is no doubt but to such source can be traced some, otherwise unaccountable, bad settlements of large buildings; yet, how few of our professional brethren ever dream the possibility of such a cause.

To make this matter more plain, let us suppose a case, in which the Architect has probed his site throughout, to say ten feet, and found it apparently sound. Now, at one point, which may be the locality of a corner, we will suppose a large boulder to be down twelve feet, or two feet below his probing, and under this boulder a lodgement of water increasing or decreasing with the state of the weather. The ground immediately over such boulder will be firm and compact enough, to resist the probe sufficiently to inspire the examiner with confidence. The building is erected, and, perhaps, finished, without any appearance of defective foundation. But the secret action saps beneath. The boulder at last, under the pressure now on it, sinks down in its moistened bed; and the fated building, fractured at its corner, is irredeemably injured,—perhaps made so dangerous, as to oblige its being taken down.

A similar fate lurks in the sand stratum, which underlies an apparently firm footing for foundations; and calls for the cautious skill of the examining Architect. A knowledge of Geology might here be made available; but how very few give sufficient attention to the subject, the most being too anxious to hurry forward the erection of their design, or too careful of putting their patron to what, to him, might seem unnecessary expense. The surest safeguard, against such hidden dangers, is to be found in *piling*, and such work,

when efficiently done, is well worth the outlay, whatever it may be.

There are other methods, which are good, but we place piling foremost in the rank of precautionary measures, and shall now describe it.

When the necessary excavations are made for cellar, or sub-cellar, as the case may be, the trenches for the foundations are dug of the required breadth, and from two to three feet deep, downward, from the bottom of the cellar. In these trenches the piles are to be driven; and they must be of lengths proportioned to the penetrability of the soil. The average length may be found by driving five or six piles at fair distances; and, when the hammer stroke ceases to drive, mark the length of pile-drives; and, thus driving and marking each, the average of required length of pile is arrived at. Then have your piles, say two feet longer, than the longest. This will provide for "soft spots." Set them three feet from centres.

Piles should be of sound, hard wood. White Oak is excellent for the purpose. They should be pointed at the entrance end, and not less than nine inches in diameter. An iron ring should be temporarily set on the upper end, to prevent the continued strokes of the hammer splitting the pile, and to give a uniform surface, to receive the strokes, until the pile is driven completely home. This ring can then be transferred to a fresh pile, and so on, throughout the operation.

When the point of the pile rests upon any hard stratum, it is at once evidenced by the fact that the hammer, in its stroke, rebounds from the pile, without driving it.

The last pile being driven, they should be all cut off, to the required level of the bottom of footing course, which will leave their heads, say, eight inches over ground. This eight inches should be filled up in two equal courses: *first*, of well-rammed dry gravel; *second*, of good, well-mixed concrete, composed

of coarse gravel, sand, and cement, or water-lime, in the following manner:

Take ten bushels of gravel and six of sand, and rake them up intimately together. This thoroughly done, in a large box made for the purpose, and placed near as possible to the trenches, take three bushels of cement, in a dry state, and mix it up with the gravel and sand, carefully and well. Now pour on water, over the whole, turning and mixing the mass very briskly, slide out that side of the box next the trench, and empty the contents into their place, over the before-mentioned course of dry gravel.

Proceed and do likewise with every part of the trenches, until the concrete, throughout, is on a level with the tops of the piles.

When sufficiently set or hardened, the whole surface will be ready to receive the "planking," which is simply two pieces of white oak, or other durable timber, three inches in thickness, and ten or twelve inches in width, spiked on to the two tiers of piles. These two are to be continued in their length by others, taking care to break joints, and to bevel them on to each other. There will be a space of four or six inches between the inside edges of these two courses of planking; and this, together with the outsides, must be filled up with concrete, flush to the surface.

The *Footing-Course* is now to be laid with large flat stones, three, four or five feet in length,—as the necessity of the case may call for,—and ten or twelve inches thick. They are to be laid cross-wise, and edge to edge, being carefully bedded and jointed in cement.

The succeeding course must be laid lengthwise, but the stones composing it need not be quite as long as those of the former course. They are, however, to be "broken-jointed," and carefully flushed with cement and spalls. This course ought to be ten inches thick, but, in width, six or eight inches less than the former.

The third course ought to be built in like manner, the width being three or four inches less than that of the preceding one.

When the surface, or cellar bottom, is reached, the walls may be built of the width called for on the basement or cellar plan.

We have here a foundation that is well adapted for springy or boggy soil. But, in case the site should prove to have a sub-stratum of *quicksand*, then the ordinary piling will not answer, as the pile-driver will utterly fail to insert the piles in this treacherous material.

In such a dilemma, the architect will do well to procure MITCHELL'S IRON SCREW PILES, which will at once master the situation, *as they will enter not alone sand, but rock itself.*

This is an European invention; and was introduced in this country about twenty years ago, by the UNITED STATES LIGHTHOUSE BOARD, and liberally used in the foundations of lighthouses, under water, in rock, sand, &c. The writer being then in charge of such works, under the Corps of Topographical Engineers, had ample opportunity of noting their merits and demerits. But as architects are not called on to construct buildings in such trying locations as those whereat lighthouses and pier-heads are most frequently erected, it will be unnecessary to more than allude to the fact that, although admirable for entering difficult and otherwise impracticable strata, the Iron Screw Pile, where exposed to the action of ice or the force of waves driven by severe storms, is but too apt to break off at the cast iron section, or to warp and twist at the wrought iron one. However, where protected from such influences, it is very available for such foundations as we have here under consideration.

In our next number, we will give a full description of MITCHELL'S IRON SCREW PILE, together with hints and suggestions as to the most advisable way of using it economically and well.

FIRE ESCAPES.

IT is not a little surprising, that—up to the present time—the inventive faculty of our citizens should have failed to produce a FIRE ESCAPE, free from objections. We have a variety of makeshifts; but nothing really worthy of public patronage.

In New York an appendage to tenement houses has been introduced—in the form of an iron balcony on the centre of the front, or rear, of each story—from which a narrow, perpendicular ladder leads to the next below, and so on, down to the ground. The ground one, or first story ladder, is, however, not left in place, lest the burglars may make it available in forwarding their peculiar interests.

Looking at fire escapes, as more peculiarly required for women and children, or the aged and disabled, these balconies are, at best, but a poor device; and, as for the *ladders*, they are a most stupid contrivance. Who, but a man of nerve, would venture on them at the fifth or sixth story of a house? And, suppose the floor on fire, and the flames issuing through the upper windows, would not those balconies be turned into gridirons, to roast the unhappy victims, who in their distraction sought safety through them?

The Fire Department, in each and every city of the United States, has ladders which have, in the hands of the gallant firemen, proved valuable in saving life. But how often has this means of rescue failed in New York, where crowded tenement houses are the rule. These ladders give ready access to a burning building, it is true; but, may not a human being be perishing in one part of the building, while the firemen are forcing their way through another?

The fact is, the means of escape should be ready, on the spot, and such as to give confidence to the endangered inmates. Ladders are not at all fit for this purpose. As we have said, they are adapted solely for man. Means of escape for the weak and the timid should be provided, for the sake of humanity, of an unexceptionable contrivance, by which deliverance would be within individual reach, certain and speedy. Such would, indeed, be a boon beyond price to the community at large, and, to women and children in particular, well worthy of any effort to obtain it.

Let every one capable of adding a single suggestion towards the working out of this humanitarian problem, do so. It must be satisfactorily solved some day. Why not now?

SCENIC EFFECT.

The art of Painting is practiced in two entirely different methods. One artist elaborates, without regard to time or pains, for the sake of obtaining an exceedingly smooth surface, resembling enamel. By this method, every part of the picture will bear the severest scrutiny, and the general effect may be extremely good, although not likely to be so satisfactory, as in that picture produced rapidly, by an artist well versed, from long previous study, in the principles of effect, apart from the elaboration of details. Those of the latter school have in their favor the fact, that we only see clearly about $2\frac{1}{2}^{\circ}$ of the circle at any one time. Therefore the details are wasted. The scene-painter belongs to the latter class. All his effective work is produced by simply using yellow ochre and any suitable blue and red, mixed with water, and aided by the mellowing of artificial light.

SLOAN'S ARCHITECTURAL REVIEW AND BUILDERS' JOURNAL

AN ILLUSTRATED MONTHLY.

CONDUCTED BY SAMUEL SLOAN, ARCHITECT:

ASSISTED BY CHARLES J. LUKENS.

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MONTHLY REVIEW.

OUR ARCHITECTURE REVIEWED.

THE cities all over the country are more or less embellished with the architectural improvements of the times. Buildings that were honored time-marks have disappeared; and even modern structures have been removed to make way for the rising style, which fashion has decided on, as the next in order. For Fashion does rule in Building, as in dress. Still, although not at all as changeable, it is yet quite as distinct in its features, when it does assume a new appearance.

The fashion in architecture, like that of the *beau monde*, is apt to repeat itself, as though the inventive power could not go beyond a certain boundary line. Thus, we see our sisters, wives and daughters to-day wearing many of the fashions of their great grandmothers. So, in Building, we easily recognize in those fresh-looking elevations a resurrection of the architectural emanations of what, in our student days, we were taught to look upon as those barbarous piles of the Dark Ages, when design ran riot, and construction unbridled by rule or reason, laid every diversity of form under contribution, to produce a highly wrought conglomerate.

Yet, out of evil cometh good; and

from the *debris* of this very chaos of architecture we have drawn some choice relics, that, in the hands of a true artist, are made to redeem many of the sins against taste, which their originators were so lamentably guilty of. In times past, which, in this young country of ours we are apt to look upon as ages, the GRECIAN and ROMAN styles were the models adopted for public and private buildings. And fearfully were those models treated. In fact, so great was the liberty taken with them, that we very narrowly escaped the misfortune of this being taken by the world for an indigenous style. Not but that there were some fine specimens of what might truly be called classic art, in those times, some of which remain to this day. But we particularly allude to that mode of Grecian in which the *arch*, the *dome*, and even the *spire*, were all pressed into the service, and made to do duty in the construction of a gross absurdity. This conglomerate was to be met with, all over the country; and may even still be seen, where the pressure of improvement has not urged its deserved destruction.

There is scarcely a single one of the architectic worthies and unworthies of

Europe, who struggled for fame in ages past, whose theories have not been worked into practice in our country just as their musty folio books happened to be in the possession of the respective knights-errant of the drawing-pen.

But, as we have already said, there were some exceptions, and excellent ones too, in favor of the true taste of that by-gone day; and we would not have them forgotten, as, indeed, they cannot be, so long as we can look upon and comprehend the classic purity of such edifices as are to be found in our own city, and which are pre-eminent as monuments of taste, whether of this day or that. Chief amongst these we would place the Custom-House, originally the United States Bank. It is said to have been modeled after the Parthenon at Athens. This we may very well question. But whether or no, it has undeniably a very perfect frontispiece of pure Doric. The Mint, and the Exchange, are each commendable in most of their features. But it would be invidious to go farther than these, in representing our Philadelphia claims to taste, amid the mist of composition, which so darkly hung over the land, when they were dedicated to Fame.

New York has a claim to consideration, in this matter, that cannot be passed over. The United States Sub-Treasury is decidedly a noble specimen of Grecian Doric, not alone in its portico, but throughout the whole building. The Custom-House is a very striking feature in New York architecture, which has, in more recent days, been materially injured by the addition of an attic, monstrous to the observer, but doubtless desirable to the officials and employees, for whose accommodation it was perpetrated.

The City Hall of New York has, for a fair share of years, enjoyed the *otium cum dignitate* of being the only object of interest, in an architectural sense, in that metropolis. It is in the Italian style, decorated. The front presents a

very good appearance, even in our day of progress. Three-fourths of the building are of marble. But, strange to those uninitiated into the secret, the rear is of brown-stone. Why? Because, when this City Hall was erected, it stood at the limits of the then city; and as it was thought, by the unprogressive building committee of the day, that the rear elevation would never, by any possibility, become prominent, it was sagely judged advisable to treat it with economy. This elevation has now assumed a prominence unlooked for, and will present a still more marked appearance, when the new white marble Court-House, which faces it, shall be finished. Which, to be sure, is a subject of time, for, judging by the progress of this latter building, up to the present, there is a grave doubt as to the completion of it at any period within the limit of existing life.

We might follow up this subject of the early classic buildings of the various cities, throughout the nation, were it not, that in so doing we would alike exhaust the patience of our readers, and the space in our Review. Suffice it then to say, that in the designing of all public buildings, erected by the Government, the classic styles of Greece, dressed in one or other of its three orders, but especially the Doric, was invariably chosen, and generally carried out with the largest amount of taste.

As regards Ecclesiastical Architecture, we find a wider field for reviewing the efforts of early days. For, in the erection of churches and chapels, there has been a liberty assumed, which nothing, save the utter apathy of the public for architectural design, could have tolerated. The earliest structures were intended to carefully avoid all that our Puritanic forefathers considered as abominations, namely: Spires, minarets, pointed doors and windows, buttresses, and the many accessories of Ecclesiastical Architecture, as it existed in Europe. All this the Pilgrim Fathers

viewed as stately worship, and took every possible pains to avoid. Their churches they called meeting-houses, and these were as plain in external and internal appearance, as they could well make them. To such an extent did they carry their opposition to every thing bearing the slightest approximation to the worship of former days in England, that they insisted on having the reading-desk placed at the side, instead of at the upper end of the auditorium. Aisle or nave they had none—gallery they would not admit of. In fact, nothing that could in any way remind them of the manner of worship, or the churches they fled from.

But, all this asperity gradually lost its edge, as the rising generation grew; and at last the primitive meeting-house began to put on some architectural airs, which grew with the growth of the community, until, by slow degrees, the forsaken features of Ecclesiastical Architecture became so prominent, that the very styles of most imposing prominence began to raise their fancies, to lead the way for still more decorated structures; and to so completely overshadow their early parent-buildings, as to leave them as simple objects of interest to all who yet cherished the memory of the Pilgrim Fathers.

A compromise seemed to be tacitly agreed upon, between the more and the less progressive of that day. The former, still holding to even the semblance of Puritanic taste, chose the classic temple, with its beautiful façade, in its simplest form. The latter took hold of the more aspiring style; and, at first placing belfries on the front pediment, soon ventured on a tower, and sometimes two towers, one on either corner.

At length the Gothic was the ambition of the time; and at this day we have among us many specimens of what was then considered art unsurpassed. Park Street Church, in Boston, was a wonder in its day. It was intended for a Grecian design; but with an extremely

heavy spire, more adapted to a Gothic building; and this error of judgment arose some two hundred feet into the air, being at that time the highest spire in the United States.

Our German and French designers gave us many transfers of their national taste; and made of our cities a series of schools for the study of the varied forms in which indifferent Architecture may present itself for study or for criticism.

In DOMESTIC DESIGN our primitive builders displayed a modesty that was, to say the least, commendable. For, with the exception of the pleasant old *stoop*, with its orderly columns and cornice of no order at all, we had nothing to find fault with, because nothing was presented as a temptation. All was unpretentious, yet comfortable.

The next generation, as to their ecclesiastical ideas, were more ambitious; and the styles, with their apportioned Orders, began to make themselves prominent in all our cities, as well in dwelling-houses as in public buildings. To such an extent did the desire for classic fronts carry our citizens generally, that it became necessary to issue books of instruction on the Orders, which were rapidly bought up: and had a very desirable influence in the hands of the builders.

In so rapidly rising a country as this, the growth of improvement was not to be easily retarded; and Street Architecture soon began to be a subject of considerable importance. The devices of Europe were grafted on the requirements of America; and a style, peculiar to the Nation, generated, which could not be properly called National; and yet to all intents and purposes was so.

The spirit of equality gives an impetus to ambition, which can only be limited by the purse; and this is very apparent in all our cities to-day, as well as it was in the day we are reviewing.

The Domestic Architecture of that time was highly indicative of a desire

for Greek and Roman fame, whether in the palace of the millionaire, or the home of the operative. Our streets were panoramic elevations, and continuations, of classic porticos, pediments, antæ, and all the features which appertain to Roman or Grecian composition.

THE ARCHITECTURE OF TO-DAY is a far advanced step in the great march of improvement; and shows out very distinctly against the classic back-ground, we have just been speaking of. Its features are those of the reformed school of Europe in a mitigated form. We have not had the full spirit of the *renaissance* infused into our architectural conceptions as yet. Probably on account of the National repugnance to the gew-gaw which is too frequently the necessary accompaniment of that modern rejuvenation. In New York some efforts were made to direct the public taste in this line; but they failed to establish their claim; and the Academy of Design, and the church of Dr. Bellows, are the memorials of that transmigration of mediæval art-life, which remain, to draw the wondering eyes of the million to their highly-colored incongruities.

Our public buildings have shown a disposition to reform, in a moderate way, from the pedantic classic, hitherto so rigidly observed; but have been careful to retain Palladio, as their monitor and guide. In this there is safety for the public taste; because he, of all authorities, is the one whose judgment may be relied upon at all times, as an artist with a philosophic eye.

ECCLESIASTIC ARCHITECTURE, in our day, comes to the front as *seniores priores* of studied and discriminated taste. We find no repetition of the barbarous admixture of styles, the pedimented Grecian with the minaretted Gothic, or the hundred other cool absurdities to which, hitherto, our ecclesiastical constructions appear to have been inevitably doomed. And from the ultraism of mediæval taste, the sacred edifices, with one exception, have fortunately been kept free.

DOMESTIC ARCHITECTURE, in its wide domain, shows the largest amount of importation of the building fancies of the day in old Europe. We have in our own store-fronts all that

"Saracen or Christian ever knew"

of architectural art; and their details are blended up with native judgment, which will play most extravagant pranks at times, to form a variety of styles, which might well, for all practical purposes, be congregated into one, and aptly called "COMMERCIAL."

THE DWELLING-HOUSE ARCHITECTURE of to-day is a vast improvement on the trials of the past; and, in our first-class houses, rapidly approaches the palatial. Our merchant princes seem to vie with each other in the spirit of improvement; and all that wealth can do is ready to be done. Genius in Design is the one thing wanted; and it behooves our professional brethren to meet that want in a manner worthy of their present profit, and their future fame.

THE PROJECTIONS OF THE SPHERE

Are the Orthographic, the Stereographic, the Gnomonic—all of whose names are derived from their qualities—and Mercator's—so called from the celebrated navigator. The Orthographic and the Stereographic are those that afford the usual disc maps of the world, in two hemispheres. The Gnomonic—thus titled from its projection being of the nature of a sun-dial plate—requires six maps for the cubed whole earth; and is very seldom seen; there being, however, a fine instance in the General Atlas of the London Society for the Diffusion of Useful Knowledge. It is excellent for Maps of the Stars. Mercator's—developed from the cylinder circumscribing a sphere—affords a desirable sailing-chart.

THE MINSTERS OF EUROPE.

THE great temples of worship, which have so firmly maintained their pre-eminence, throughout the earth, and stand, up to this very day, as witnesses of the wonderful art-power of man, are led by the heathen, of which, curious to say, the Islam has the largest in the world, St. Sophia's, at Constantinople. Although, in point of fact, this great Mosque was originally planned and erected for a Christian church, by Constantine, whose intention was to surpass any thing that had previously been erected; but which fell into the hands of the followers of Mohammed, preserving to this day its Christian name, and nothing more, to connect it with its origin.

Next to St. Sophia's, in vastness of proportion, comes St. Peter's, at Rome. Bijapoor, in India, has a Moslem temple, which claims the third place. The fourth in size is St. Paul's, London. We allude to the fact, in this place, to show that the energy of heathenism in the erection of capacious and splendid temples, dedicated to false deities, was a slur upon the Christian world, whose Minsters, dedicated to the true God, should be pre-eminent as their faith.

Europe possessing the largest and finest Cathedrals, or Minsters, of the Christian World, we now enter on a review of that interesting field; and, as we have already spoken, at large, on that of Milan, we will now take up the no less interesting Minster:

COLOGNE CATHEDRAL.

No ecclesiastical structure more charming in outline, embodiment, and effect, as far as constructed, attracts the attention than this. The very slowness of its progress is a feature in its history; and, to add to its romance, the very name of its architect has been lost; although his professional existence may

yet be traced in the following wild legend:—

In 1225 the Archbishop Engelberg conceived the idea of building a Cathedral, which should surpass every other one in the world in magnificence. Hochstedten, his successor, determined to execute it; and employed the most eminent architect he could find. He supplied him with all the treasures of the churches of Cologne, and put him in possession of the fine quarries of the Drachenfels. The architect traveled over Europe, envied by all his professional brethren; and came home, at last, full of knowledge; but quite unable to please himself in a design. Day after day he sat in a retired spot, studying and tracing on the sand, his lines of composition; but ever without satisfying his imagination. One evening ere the sun went down, as he continued his vain effort, a little, old man appeared at his elbow; and showed him a plan, so complete, and so surpassingly beautiful, that the delighted architect demanded who he was, that could so far surpass him. The old man declared himself to be Satan; and so ambitious was the architect of securing his fame forever by its possession, that he agreed to give his eternal bond to the Evil One for it. They parted to meet at midnight. Meantime, the trembling architect sought the advice of his confessor, who gave him a holy relic and told him when he met the devil that night, to ask to see the plan again. Then, to lay firm hold of it, at the same time waving the relic in the devil's face. He did, as directed; and the Evil One let go his hold, leaving the architect in full possession of the plan! In triumph he flew to his confessor, who warned him of the necessity for his leading a sinless life, and especially to beware of *Pride*.

COLOGNE CATHEDRAL went on. It

grew, day-by-day, in strength and beauty. One tower reached a commanding height. Its sister tower arose to a point lower, when the archbishop happened to send for the architect; and, displaying to him a drawing of the temple at Jerusalem, asked his opinion of it. The architect, drawing himself up, declared he liked his own better. Instantly the room echoed the peal of fiendish laughter, which told the conscience-stricken man he had committed the dreaded crime *Pride*!

The archbishop, grieved at his fall, sent him at once to seek pardon in repentant prayer to God. After a time he seemed to receive consolation; and mustered courage to seek his beloved work again. He mounted the ladder to the top of the unfinished tower; and stayed there directing, watching and studying, until the approach of night and a storm warned him, it was time to retire. He sought the ladder—it was gone! The storm increased; his terror grew. At last, following a heavy crash of thunder he perceived, by the succeeding flash of lightning, that the fiend stood, in all his hideousness, before him! His brain reeled, his eyes closed, and headlong he fell in the tumultuous darkness of that dreadful October night. The fiend winged rapidly down after his prey; but the "God have mercy on my soul!" which had come, as the last words, from the dying architect, received a ready answer, in the form of two angels, who caught him mid-way, and bore him to heaven. The fiend passed them—and, even amid the awful peals of thunder, the architect caught his mocking cry—"Unknown—unknown—unfinished and unknown!"

The prophecy of the fiend is realized. The architect is unknown—the Cathedral is unfinished.

Yes, nearly six centuries have elapsed since the foundation was laid; and still this mighty minster stands unfinished!

1322, was finished 74 years afterwards. It was more than one hundred years, before the works recommenced. The south tower was carried up 150 feet and the north 20 feet above the ground.

The original design, which is still extant, was lost for centuries and recovered in a remarkable manner. It comprehended two great towers with spires, at the west end. These towers and spires were designed to be 536 feet high. They were to be unsurpassed in beauty and delicacy of ornament. The height of the nave was to be 150 feet. It was to have double aisles, including which, the breadth would be 150 feet. The transepts and choirs beyond these, were to be 208 feet in height.

The total length of Cologne Cathedral is 500 feet or $3\frac{1}{3}$ times its width, being considerably less in proportion than the received standard rule for such buildings, viz.: six times the breadth.

At the end of the 18th century the condition of the works was as follows: The choir and aisles, the chapels, the two northern aisles of the nave, and the sacristy were the only portions which were completed. The nave and two south aisles were carried up to the height of the capitals of the great arcade, and covered with a temporary roof.

In this half-finished condition it lay, when the soldiers of the French Republic took possession of the city, and considerably injured it by stabling their horses in it. Notwithstanding all the strenuous endeavors made, after the peace, to have the building restored, it was not until 1821, that, through the energetic efforts of the King of Prussia, and enthusiastic aid of the citizens of Cologne, a society was formed, to carry out the project of continuing the works and completing the building, in its unity and integrity, in perfect accordance with the original design. All Germany and France took up the enterprise. Foreign princes made themselves responsible for large sums of money, and general contributions flowed in liberally

The Choir, consecrated September 27,

on all sides. Stained-glass and large quantities of materials were donated.

The great work was vigorously pushed forward, at intervals, during the century; and its present condition may be thus described:

The choir has been entirely restored, inside and out. The whole of the interior of the Cathedral, with slight exceptions, has been completed.

On the 2d September, 1867, the grand square round the north and east sides was opened to the public. It is a most magnificent work, adding greatly to the dignity of the exterior of the Cathedral; and making a marked contrast with the miserable surroundings of former years.

Special mention must be made of one of the chief ornaments of the interior, the restoration of which has been recently effected, namely: The Reredos of the Altar, in the eastern aisle of the south transept, the carving on which is the most elaborate and exquisite specimen of that art in the 16th century.

The work of restoring and completing the Cathedral of Cologne was resumed in the spring of the present year; and it is to be hoped, that the grand old minster may yet be completed, and that in our day may thus be united the art of the middle ages with that of the 19th century, thus honoring the work of the UNKNOWN ARCHITECT of six and a-half centuries ago, and falsifying the legendary prophecy—"Unfinished!"

STRASBURG CATHEDRAL.

By many this magnificent work is placed in the foremost rank of European minsters, as the noblest of Gothic edifices. If purity of style be a test of architectural character, we would most decidedly object to this sweeping assertion of the pre-eminence of Strasburg. At the same time, we would be most willing to give to it all that credit, which its really unrivalled execution as a wonderful work of art deserves.

The Romanesque Choir is undoubtedly the work of an earlier day; and

here Strasburg is in a similar predicament with Milan in having an incongruous mixture of styles. Apart from that objection, the fascinating tracery of the former can never fail to attract the admiration of the most critical, it presenting the appearance of a gorgeous screen of exquisitely cut stone encasing the building. But, the effect is not altogether satisfactory, owing to the confusion created by the intricacy of lines, which, in their multiplicity and constant intersections, are the cause of the indistinctness, so much complained of by all who look upon it, even for a lengthened time.

The Spire is the great object of admiration, rising as it does 468 feet above the pavement, making it the highest *spire* in Europe, and actually 24 feet higher than the great Pyramid of Egypt.

Unlike Cologne, the minster under consideration has its Architect's name preserved. It was the work of ERWIN OF STEINBACH, whose plans are now to be seen in the building. When he was born we do not know but he commenced the nave in the year 1015. He died when his great work was in a forward state. It was continued by his *sons*, and after by his *daughter*, and finished in 1275, which last fact is certainly suggestive of the ability of woman to work out gigantic ideas in architecture; and clearly shows the way to the gentle sex to enter on the study of this, hitherto, to them almost unknown field. The beautiful Cathedral holds the cherished remains of this, its family of architects. It was not until 1439, or 424 years after its commencement, that the tower was completed, under the superintendence of JOHN HULTZ, of Cologne. Thus the professional skill of the one city was employed on the two rival minsters of Europe, giving to Cologne the advantage over Strasburg. The original architect, Erwin of Steinbach, however, has insured his fame, by executing a statue of himself, which occupies a position, where he and his son and daughter are

interred, within the walls of the south transept. The family tombstone was found in a little court behind the chapel of St. John.

Besides the spire, there are some other very remarkable features in this edifice. The most prominent is the vast and beautiful Marigold window at the west. It is 43 feet in diameter, and this great west end itself is 230 feet high; the rich painted glass, executed in the 15th century, filling nearly all the windows. The Stone Pulpit, the Font, and the Clock, are all wonders. The clock is altogether new, being made by an artisan now living in Strasburg, to replace the historical one, which was rapidly falling to decay.

Before quitting this magnificent work of art, we may observe, as an interesting fact, that the parent *Lodge of Masonry* throughout Germany, was the *Guild of Freemasons* founded at Strasburg, when the Minster itself was commenced, in 1015.

In reviewing those two grand Ecclesiastical structures, we are led to borrow some consolation for the grievous delay of certain of our public buildings in this country, from noting the hundreds of years, which intervened between the eras of progress, in their construction, as well as the limitless treasures of money and materials expended on them.

Leaving these stupendous monuments of Ecclesiastic art, we will now review one of minor fame, yet attractive to the eye of taste:

ANTWERP CATHEDRAL.

Commenced in the middle of the 13th century, *Notre Dame*, as it is entitled, was finished in 84 years. Quite a rapid construction for the times, when we consider the size of the building, one of the largest and most beautiful specimens of Gothic architecture in the Netherlands. It was unfortunately burnt in 1533; but the tower and choir

were preserved. The Minster was rebuilt the following year. It is 500 feet long and 250 feet wide. The interior is at once simple and imposing; the effect of the vastness of its lofty choir and nave, with *treble* aisles on each side, is assisted by its being all finished open, and on the same uniform plan throughout. It was sacked by the fanatic Iconoclasts, or image-breakers, in 1566, when its rich altars, ornaments, and sculptures, were either burned or carried off.

In the choir a chapter of the Golden Fleece was held, in 1555, by Philip II., of Spain, at which *nine kings and sovereign princes were present*; and assisted as *knight*s of the Order.

The spire is next in height to that of Strasburg, being 403 feet 7 inches; and is of such beautiful and delicate Gothic workmanship, as to have caused the Emperor Charles V. to say, it deserved to be kept in a case; while, from the minuteness of the carved work, Napoleon compared it to the Mechlin lace. It was begun by the architect, Jan Amelius, 1422; and completed by Apfelsmans, of Cologne, 1518. Thus giving an architect of Cologne again the honor of completing another of those mighty minsters of Europe. This steeple may not be considered a stone structure. It is rather a framework of iron bars, with bits of stone strung upon them, like beads, held together by copper bolts, the gaps and interstices being filled up with plaster, and the joints partly covered with lead.

The Foundations of the Tower descend many feet below the ground. It has been carefully repaired and restored at great cost.

The original design contemplated a second spire of equal height to that built. It is doubtful, however, whether the effect would have been improved.

During the bombardment of the town from the citadel in 1860, Gen Chassé's artillery knocked off one or two of the pinnacles of the steeple.

In the tower is a very extensive set of chimes, composed of ninety-nine bells, and one very large bell, at the baptism of which the renowned Charles V., of Germany, stood *godfather*! It required sixteen men to ring it.

Near the foot of the tower is an old draw-well, covered with an elegant Gothic canopy of iron, which is the work of the justly celebrated artist QUENTIN MATSYS, the blacksmith of Antwerp, whose history is a bit of romance. Having fallen in love with the daughter of a painter, he found he could not obtain the consent of the young girl's father, unless he relinquished his trade, and assumed a profession. Quentin Matsys was too much engaged in this *affaire de cœur*, to be thus debarred of his coveted prize. He turned his thoughts to *Painting*; and soon mastered and excelled in that art. He won his lady-love and reputation at the one effort. At the west door of the Cathedral, on one side, is a tablet to his memory, whose wonderful works are the prized jewels of the museum. It bears a Latin inscription of which the translation is as follows:

"'Twas love connubial taught the smith to paint."

His body is interred at the foot of the tower

But, after all its attractiveness of design and execution, it is to its vast treasure of immortal paintings, that Antwerp draws the attention of the traveler. Amid the beautiful works of RUBENS, which so enrich it, there is, perhaps, no picture there can compare, in all points, though some are truly wonderful, with that master's *Descent from the Cross*. It hangs commonly in the south transept, near the door leading out of the Place Verte.

In the opposite, or north transept, is the *Elevation of the Cross*, which, though not so perfect a work of art, as the *Descent*, is still a wonder of effective drawing and painting. In the centre is *Christ nailed to the Cross*, with a num-

ber of figures exerting themselves in different ways to raise it. One of the figures appears flushed, all the blood rising into his face, from his violent efforts;—others in intricate attitudes, which, at the same time, that they show the great energy with which the business is done, give that opportunity, which painters desire, of encountering the difficulties of the art, in foreshortening and in representing momentary actions. It is, unquestionably, one of Rubens' best and most animated conceptions.

One other of this great master's works is a *Pietà*, the dead body of Christ laid on a stone table, covered with straw, mourned over by the Virgin. This is one of his most careful pictures. The characters are of a higher style of beauty than usual, particularly the Mary Magdalen, weeping, with her hand clenched. The coloring of the Christ and the Virgin is of a most beautiful and delicately pearly tint, opposed by the strong, high coloring of St. Joseph. It has been said by his critics that Rubens does not appear to advantage but in large works. This picture may be considered an exception.

But, as we are reviewing the architecture of the European Minsters, we will not venture farther on the enchanting field of *Painting*, especially when RUBENS witches us away. To return; then, we will take a parting glance at the beautiful works of which we have endeavored, from memory, with the aid of books, to present to our readers.

COLOGNE, magnificent in its incompleteness, gives the mind a chance to wander into the imaginative dreams of design, which will most suit each artist. STRASBURG, in its gorgeous lace-work of stone, the very petrification of magic art leaves the mind bewildered in its mazes of intricate beauty. ANTWERP, like an elaborated repository of the sublime in art, quietly presides over her domain of genius, an empress worthy of her throne.

DESCRIPTIONS.

ELLIOTT AND DUNN'S NEW BANKING HOUSE.

THE march of improvement is still steadily onward, and our street architecture here in Philadelphia, as in all our greatly growing cities, is full of new and pleasing features.

As a substantial, as well as significant proof of the commercial progress we are making, we take pleasure in introducing to our readers, as yet by description, a NEW BANKING HOUSE, which has just been commenced on South Third street, below Chestnut, for Messrs. ELLIOTT and DUNN

This attractive little building will be in the *Franco-Italian* style, moderately orné. It will be eighteen feet wide, by fifty feet deep, and two stories in height. The front will be executed in marble, selected from the Manchester quarries. The body of the building will be of brick.

The first, or principal story, will have a cornice, appropriate to the style, supported on ornamental brackets, connected at their springing by a well-defined string-course. Immediately over this cornice, will rest the window plinths of the second story. And the whole frontispiece will be crowned by a highly ornate chief cornice, of elegant proportions, tastefully adorned with boldly carved rosettes. The centre of this cornice will have a graceful segment-broken pediment, with finial in perfect keeping with it, as a finish to the whole, having its tympanum ornamented with a circular centre, and two side angular panels neatly sunk-moulded.

The principal story, devoted wholly to the bank, will be of easy access, being but one step above the side-walk. Its front will be divided into three openings, namely: a window and two doors,

the former ten feet six inches high, and the two latter, thirteen feet six inches; all three to be each five feet wide, capped with elliptic heads, and having a broad, rosetted band-moulding continued round the whole of each opening. The spandrels to have a well-defined shield ornament raised on each.

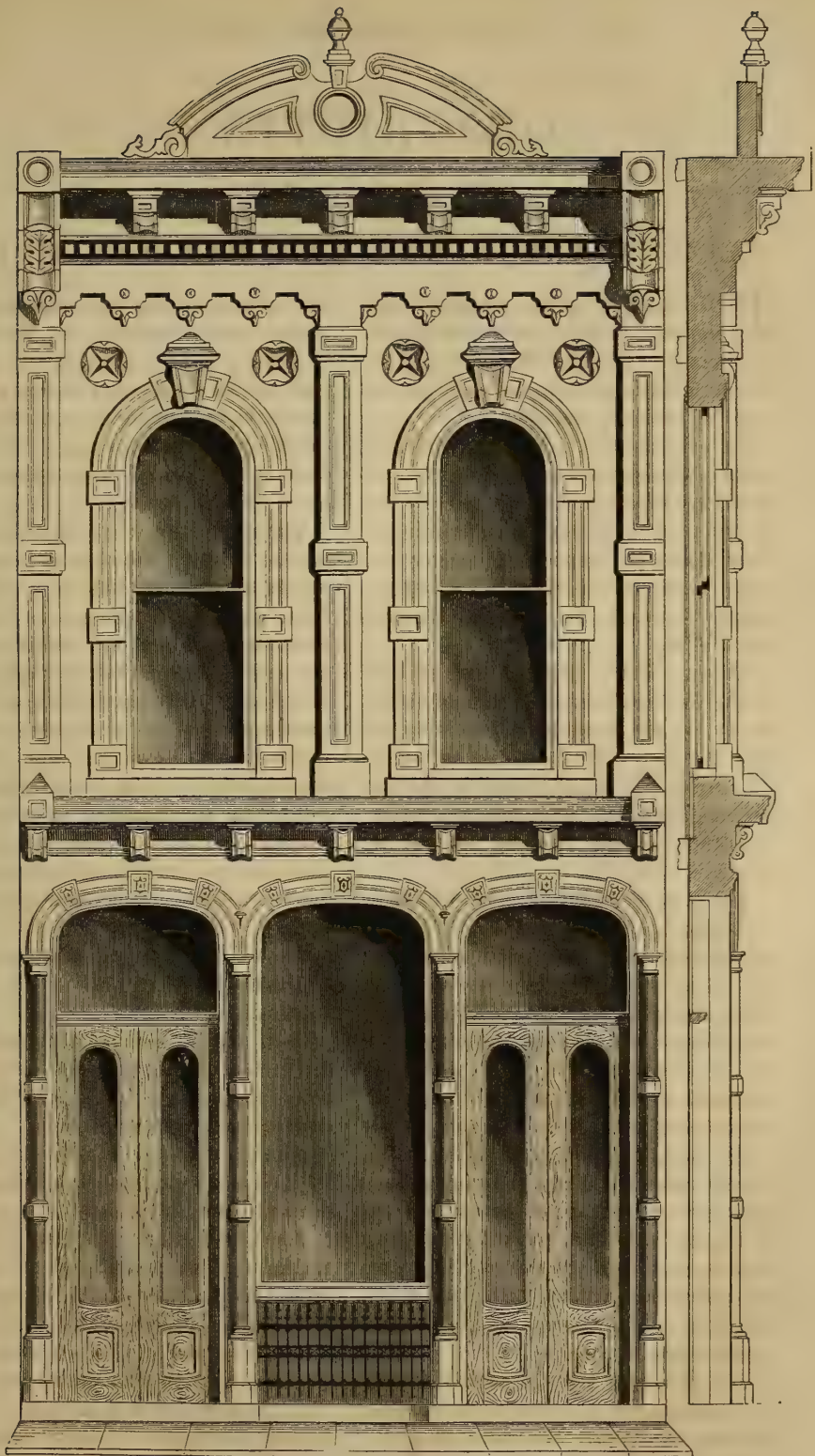
The second story will have three ornamental blocked antæ, with long sunk panels between the blocks, dividing the front into two sections, each having a window three feet six inches wide by ten feet high, semi-circular headed and completely surrounded with a blocked band-finish, with a highly wrought, boldly-raised keystone and supports sunk-paneled (as are all the blocks) and presenting a richness of effect with appropriate strength. The spandrels in this story will have large rose ornaments raised on them. The under part of the facie forming the caps of the two sections will be indented and carved appropriately, having drops at regular intervals.

Two highly enriched consoles will finish the cornice on each end of the front, the caps or blocks of which will have carved wreaths on them.

The doors and window sashes will be of polished walnut. The glass, best French plate, in single sheets.

The first story fourteen feet four inches high, to be occupied as the fiscal department of the bank, will be in one room with a private stair leading to the vaults in cellar, and a stairway rising to the apartments in the second story. This first story or bank-office will be lighted in the rear by a sky-light.

The second story will be twelve feet six inches high, divided up into two



ELLIOTT & DUNN'S BANKING HOUSE, PHILADELPHIA.

apartments, together with dressing-room, and water-closet, and be lighted in the rear by three windows.

The building is to be heated by hot-air generated from a furnace in the cellar, and carried to the flues by tin pipe; and the gas through terra-cotta pipe. The heating flues will rise in the second story the height of a table, and be covered with marble slabs.

The roof will be covered with tin and painted.

This Bank Building will, when finished, go to prove how much may be done in a small space, without at all crowding the front with apparently extraneous embellishment; and will, we hope, lead others to adopt the liberal plan of improving, even in a small way, our commercial highways.

LUZERNE COUNTY PRISON, WILKESBARRE, PA.

THERE is no description of buildings which is more deserving of the serious consideration and study of, not only our architects, but also of all who have the interests and well-being of society at heart, than that of the subject of our present description, viz, our Prisons; and none to which there has been, of late years, greater attention paid and improvements effected, with a view of combining proper punishment and discipline, with amelioration of the condition, and conducement towards the moral improvement of their inmates. Up to the close of the last century, until the distinguished philanthropist, Howard, brought the subject prominently before the notice and attention of the whole civilized world, it had been looked upon as a matter undeserving of any particular attention; the sole point aimed at, in every country, being the secure incarceration of their criminals, without any consideration, either as to their comfort, or to sanitary principles. The result of Howard's visits of inspection to the Prisons of his own and other countries, brought to light an almost incredible and fearful condition of affairs, in their accommodations and internal arrangements. "He found everywhere crowded and dirty rooms, foul and diseased air, no attention whatever paid to ventilation; all classes of offenders huddled together, foul and hardened; the grossly wicked with the comparatively

innocent, and witnesses; persons of different sexes promiscuously confined together, insufficient and unwholesome food, and abuse and oppression from the jailers and assistants." From that time, the public attention has been fixed upon the subject; and although the change that has since taken place has been very gradual, still it has been a most marked and striking one, and one which reflects alike creditably upon the increasing civilization of the times, and the more universal feeling of charity and good will, leading to the furtherance of all benevolent measures, which the well-being of society demands. We do not intend here, however, entering upon any lengthened dissertation upon this topic. We will confine our brief remarks more especially to it, as it relates to our own country. So far back as the year 1776, we find that the subject of our prison discipline, and the amelioration of prisoners, had attracted the attention of that portion of our citizens called Quakers; and societies were formed for the purpose of assisting those who were distressed. From time to time, these societies flourished with more or less of success, and have contributed greatly towards the alleviation of the miseries of public prisons, not only by their practical measures, but also by the publication of pamphlets and other documents, whereby they have succeeded in diffusing and exciting a more healthy sentiment

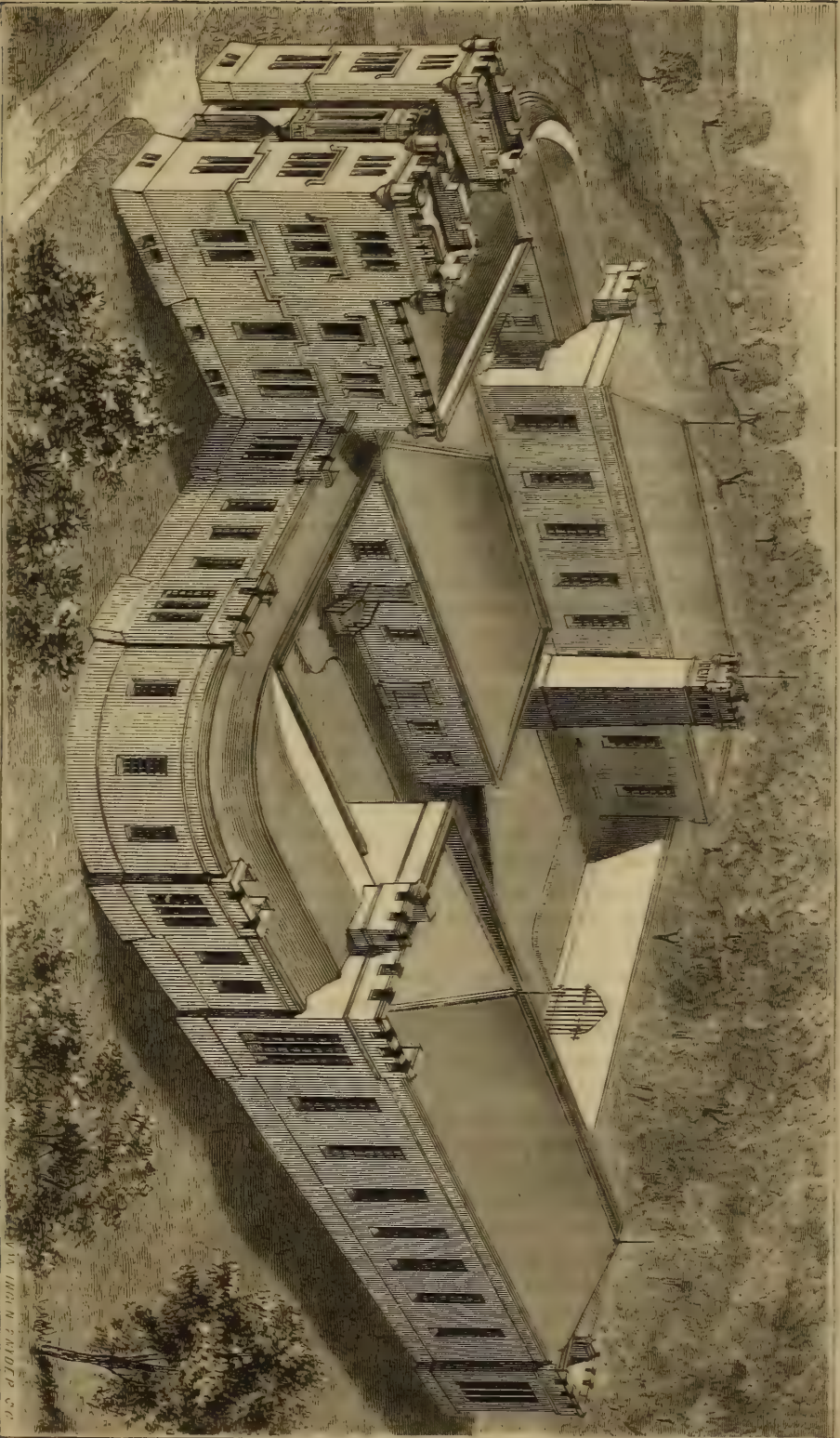
among our people and their legislators. Too much praise cannot be bestowed upon this humane and philanthropic class of our fellow-citizens, ever foremost in good works, for to them is, in a great measure, due the reformation that has taken place in our penal system.

The building which we are now about to describe, the **NEW COUNTY PRISON**, in the Borough of **WILKESBARRE**, **LUZERNE COUNTY**, **PENNSYLVANIA**, has been designed in accordance with all the most modern approved principles of construction of such edifices, assisted by the results of personal visits of inspection, by the Commissioners of the County, to most of the principal Prisons and Penitentiaries in this and neighboring States. The fullest and most reliable information upon the subject was sought after and obtained, from all who were practically interested in the subject, and had made it their study; all defects existing in other similar institutions, carefully ascertained and noted, and the result has been the adoption of a plan, wherein is combined the invaluable experience gained by such earnest and thoughtful deliberation, retaining every principle, which has been found to be sound and beneficial elsewhere; and discarding, or improving upon, other points, which have proved defective and objectionable. They were fortunate in procuring the services of **MR. JOHN MCARTHUR, JUNIOR**, an able, scientific and experienced Architect, of the City of Philadelphia, to whom they are indebted for the building now in course of erection at Wilkesbarre; an elevation and plan of which, we have presented to our readers in the present issue. The Prison is, as will be seen, of two stories, the wings each containing a double tier of cells in each story. Should it, at any future time, be desired to enlarge the building, the manner in which it has been located on the lot will permit of its being so extended without difficulty. Each wing will be constructed fire-proof, in order that, in the event of a fire taking

place in the front portion, communication between it and the wings could be at once cut off, by heavy iron doors. The style in which the whole of the structure has been designed is the castellated, or, what is more generally known, the "Prison Style;" and the effect is most striking and imposing, being quite in unison with the purpose for which it has been designed.

The building is being erected on the centre of a lot of ground, facing the Susquehanna river, which was selected on account of its peculiar aptitude and fitness. Being situated directly upon the bank of the river, (the current of which at this point is very rapid,) at a height of about 45 feet above the level of the stream, there is no difficulty in discharging and carrying off the refuse and sewage of the prison, which will be done by the very best terra-cotta vitrified drain-pipes, through a brick sewer into the river, at a point beyond low water-mark; and should, at any time, there be any need of a larger supply of water, than is now available, it could be easily obtained from the river.

The whole exterior of the edifice will be constructed of a greenish drab sandstone, and brick. The facing of the whole of the front and flanks will be of cut stone. The pile consists of a centre building sixty feet in width and about forty feet deep, two stories high, exclusive of basement, with two towers on the front, which will each have an additional story. This portion contains the residence of the Warden, also a Registering Office, Board and Committee Rooms and Laundry. To the rear of the centre building, and divided from it by a ten feet corridor, is a one story structure used for kitchen, bakery, pantry, engine and boiler-house. The ten feet corridor leads right and left to the two wings, extending at right angles from the rear of the front building, having a front of 280 feet, and running back 204 feet in depth, and of a width of 47 feet. These wings contain the prison



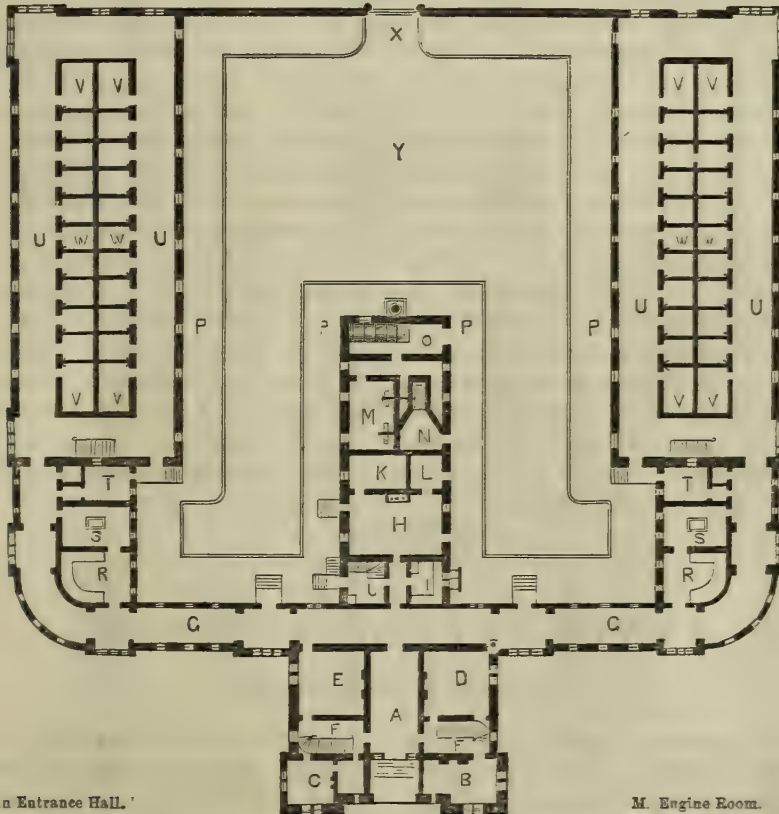
LUZERNE COUNTY PRISON: WILKESBARRE, PA. JOHN McARTHUR, JR., ARCHITECT. PHILADELPHIA.

cells, which are in two tiers, isolated from the external walls. The second tier has an iron balcony surrounding it, approached by staircases of iron. Adjoining these cells are the Lavatories, Clothing Rooms and Turnkey's Rooms. There will be in all 72 cells, 28 double, and 44 single; and so arranged that on a special emergency, each double cell can be formed into two single ones.

All the roofs, having a pitch of 30 degrees, are to be laid with the best quality slate; and all the flat portions of the roof with the best \times leaded roofing tin, all laid in the most approved and substantial manner.

To each prison wing there is provided a "food" hoist from the first story to the line of balcony of second story cells; and a dumb-waiter from the basement to first story in stair hall. All the hoisting apparatus will be of the most approved kind, and operated by hand with a crank.

All that skill and science can accomplish has been bestowed upon the mode of ventilation and of heating this building. The heating arrangement that has been chosen is the self-regulating hot-water apparatus of Morris, Tasker & Co., of Philadelphia. This has been proved to be a most convenient and



- A. Main Entrance Hall.
- B. Warden's Parlor.
- C. Office.
- D. Dining Room.
- E. Registering Room.
- F. F. Stair to Second Story.
- G. G. Corridors.
- H. Kitchen.
- I. Pantry.
- J. Stair to Basement.
- K. Scullery.
- L. Coals.

County Officers at the Period of Construction.

Hon. JOHN N. CONYNGHAM, *President Judge.*

STEPHEN DAVENPORT,
URIAH A. GRITMAN,
WILLIAM WOLF,
WILLIAM FRANCE,
WILLIAM W. SMITH,
MICHAEL RABER.

Commissioners.

STUBEN JENKINS, *Clerk.*

LEWIS HAYENS, *Contractor.*

- M. Engine Room.
- N. Ventilating Fan Room.
- O. Boiler Room.
- P. Pavement.
- R. Clothing Room.
- S. Lavatory.
- T. Turnkey's Room.
- U. Corridors.
- V. Double Cells.
- W. Single Cells.
- X. Gates to Court Yard.
- Y. Court Yard.

safe, and at the same time effectual and economical, means of warming large buildings; and consists of cast-iron boilers, made in sections, and the proper amount of heat regulated by three dampers, which again are operated upon by the expansion of the water, at the different temperatures. The radiating surface is of cast-iron.

"In order to insure the most perfect ventilation possible, a double disc ventilating fan will be used, 8 feet in diameter, and driven by steam-power. This fan is capable of discharging from 75,000 to 100,000 cubic feet of air per minute; and the air duct from it will be connected into all the radiator chambers, so that, in winter, the air is heated previous to its discharge into other rooms. The foul air in the building will be forced down through flues (one to each cell and room) into a horizontal underground duct opening into an annular space, around the main boiler flue, where it is rarified and discharged. This method, combining natural and forced ventilation, is now universally adopted in the best-appointed modern public buildings; more especially in hospitals and gaols, where plenty of fresh air must be continually furnished, throughout the entire year, to absorb and carry off the noisome effluvia and vapors arising from diseased and negligent inmates.

The ventilating and heating of cells and corridors is performed by the same process. The cool fresh air from without is brought into the building, and passing over the steam-heaters is transmitted through the corridors. The fan and the draught in the smoke-stack are connected with flues extending into the cells, two to each, one at the bottom and one at the top. By the operation of the fan and the draught of the smoke-stack, the air in the cell is drawn out, and the warm air of the corridors passes into the cell to supply its place, thereby introducing fresh air.

In all other respects, the most perfect and complete disposition has been made for the internal arrangements and convenience of the inmates; nothing has been left undone that could be devised for the comfort and the proper furnishing of the building in the way of bath-tubs, wash-tubs, water-closets and wash-basins, sinks, ranges, and plumbing and gas-fitting in general. In short, the wishes of the Commissioners of the County seem to have been most fully and ably carried out by Mr. McArthur and his assistants, Messrs. William S. Andrews, and Reuben W. Peterson, in the erection of a building, destined to remain for ages and to meet the requirements of a very large and ever increasing population.

TWIN CITY DWELLINGS.

STYLE: TUDOR-GOTHIC.

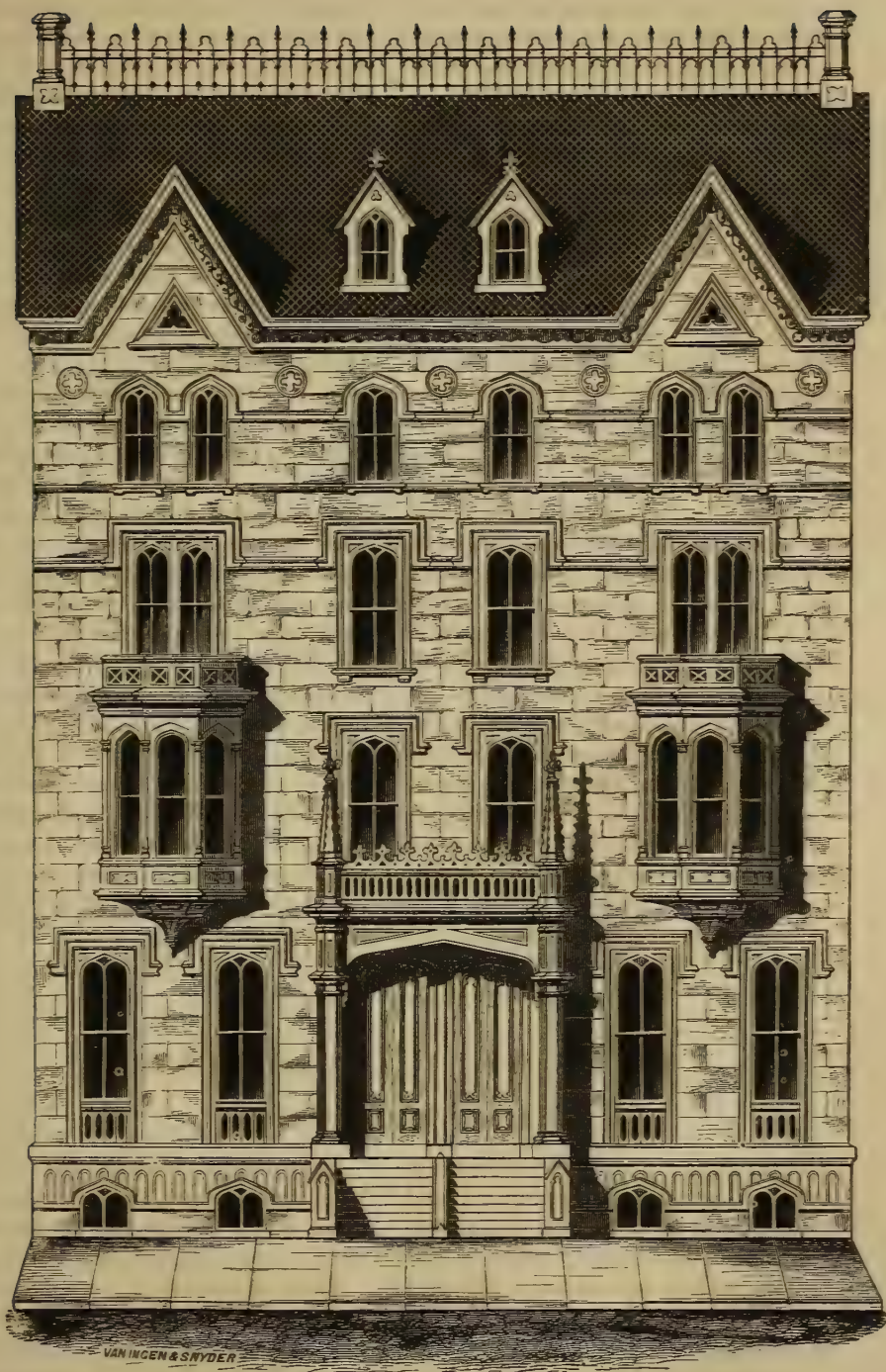
IN the preceding number of our REVIEW, we gave a description and illustration of two adjoining City Dwellings in the Italian style. We now present our readers *with the same plan and arrangement, having a front in the Tudor-Gothic.*

This design is for a four-story elevation, with Basement and Attic, as the former.

The principal difference will, of course, be in the Entrance Porch and the Windows, which features are distinctly defined in the accompanying design.

There is something very *domestic* in the character of this elevation of twin-houses, which, taken together, make such a very pleasing front; yet, taken singly, would be far from agreeable.

The Porch is composed of two front



TWIN CITY DWELLINGS. STYLE: TUDOR GOTHIC.

and two rear octagon pillared buttresses, finishing with crocketed pinnacles. From the caps of the pillared portion spring a flat-pointed arch in front, and one on either return. The roof of the porch is flat, with an open paneled baluster.

The Oriel-window, in each house, forms a most effective point; and is well calculated to add a most desirable grace to the interior, as well as the exterior of such a design. And here let us say, that Oriels or Bay-windows are additions to a house, which should never be dispensed with, if possible, by the Architect; but introduced, even at a sacrifice of strictness of style; for there is nothing gives more *life* to a room, than this pretty feature; and certainly the space it adds is an acquisition, which those who once enjoy the privilege it gives of trinal view, will not readily relinquish.

This Oriel has a flat roof, and, with its open paneled baluster, forms a balcony, for the window above to give access to, thus forming a delightful sitting-place in pleasant weather.

The Window over this Oriel is a capacious mullioned opening, forming a glass-door as well.

Coupled windows are introduced on the fourth story, having pointed hood-mouldings, whereas all the windows of the lower stories have square.

String-courses are introduced on the third and fourth stories, forming a continuation of the hood-mouldings.

Sunk panels are introduced in the basement, and underneath the windows of the parlors.

The main cornice is broken by two equilateral pediments with running ornament verge-boards, which form a continuation of the cornice. Under the eaves are large quatre-foils, an apt and handsome finish, which the Tudor style gives an opportunity to introduce here, with much effect.

The chimneys are in keeping with the general design, and the ornamental iron *combing* is aptly bounded by their pier-like appearance.

The subject of Twin City Dwellings is one of great importance, as connected with our Street Architecture. There is an objection to this close-neighborhood style, on the part of some, who desire to declare their independence as palpably as possible. But where fronts are necessarily limited to a small space, how requisite that the true pride of citizenship should exercise its influence in this matter.

We do not advocate the monotonous mode, adopted by the Russian Architects, in St. Petersburg, of making a whole street uniform in style, and in numerous instances giving the appearance of one continuous building to such street-side. It presents too much the appearance of a barrack front; and certainly does not impress one pleasantly. At the same time, we do not urge the other extreme, that of making a confusion of various small fronts. It is obvious that the *medium in res* is the Twin Dwelling system, unless, indeed, in the case of any proprietor being desirous of erecting a large mansion.

The uniformity of sky-line, produced by a long stretch of cornice on one level, is another question, which might find advocates on both sides. For our part, we are most decidedly of opinion that the *picturesque* in street architecture is more surely attained by breaking up the sky-line as much as possible. English Architects, visiting New York, sometimes find fault with Broadway, for its irregularity of street front. But does not this fault-finding apply as well in London? Are there not fronts there in every street (except Regent, and some few others, not strictly business streets) which are as diversified in height, style, color, and finish as Broadway? And be it remembered by our transatlantic critics, that this is a highly progressive nation, and our generations as changeable in taste, as in circumstances. The business firm of to-day could not think of continuing to occupy the premises of ten years ago: wealth has accumulated;

and that fact must be duly witnessed, by a suitable architectural monument, in the form of a palatial store, the chief object of which is the very laudable one of attracting custom: for, be it distinctly understood, that our simple Republic is very much inclined towards trading in the grandest places.

But, to return to the subject of Twin Dwellings, we would urge their advantage over the single form, as an architectural one. Forms, which can be easily composed by thus spreading a design, could not possibly be attempted in the single mode. This can be at once seen, by reference to the accompanying plate. The same style of porch there shown, if executed in half the breadth, would have a very different effect; and the same may be said of the Oriels, and the coupled windows.

But, there is no use in dwelling longer on a subject, which must be evident to every one. We hope to see our professional brethren perfectly untrammelled, by the sensitive objections adverted to, and left to the guidance of their taste, in the skilful arrangement of those compositions, which, taken collectively, form the Street Architecture of those sections of our cities, devoted to the private residence of our wealthier people.

REFERENCE. — A. Foundation of Porch. B. Balusters to Steps, with saddled caps. C. Octagon Pillars. D. Paneled Door-Jambs. E. Floor of House, continued out over Porch; with glass-door, or window, opening on it. F. Gothic paneled balustrade. G. Plan of one of the Windows. H. Elevation of ditto.

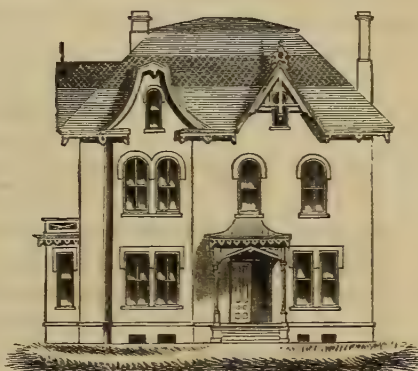
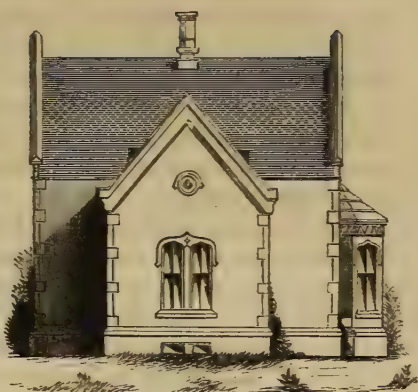
COTTAGES FOR THE LABORING CLASS.

IT is the first duty of society, for its own sake, to entertain every practical proposition for the amelioration of that great section of the community whose necessity it is to live in large cities. It will be found always, that the want of an orderly and comfortable house is among the chief evils of the poor.

Among the unhappy influences exerted on this class, is their living in the sight and midst of innumerable comforts and luxuries, which are far above their reach. The same thirst for enjoyment and excitement, which drives the rich and prosperous from their pleasant homes, to scenes of novelty and stirring amusement, drives the poor to where they can forget, for a time, the wearing realities of life; for in every poor man's neighborhood there flows a Lethean stream, which first affords him pleasurable excitement, and then buries him for a while in oblivion of all his humiliations and sorrows.

No country in the world has done more for the advancement of intellectual cultivation than ours; as may be seen in the number and surpassing excellence of the public school buildings in our cities and villages. But there is a want, which must be met, before we can hope to carry out the intention of educating the masses—and that is the providing them with *comfortable homes*. A permanent home for themselves, and one in which to bring up their children, is the greatest physical want of the poor.

Those of the laboring class residing in small villages have also a claim on the attention of philanthropy in this matter, so that not alone cities, but in fact, the entire face of the country presents opportunities innumerable for improving the social condition of our fellow-beings. And now is the time to take hold of the great question; for, even now our country is learning the absolute necessity for some provision being made for the enormously increas-



ELEVATIONS OF THREE SMALL COTTAGES.

ing poor population, which strongly appeals to us, for a shelter superior to that which they could obtain in Europe.

This land is the fond hope of the emigrant. We have it in our power to, partially at least, realize his dreams, by bettering his condition, and giving him a home suitable for a human being.

The capitalist may find it not unprofitable to study the subject; and the philanthropist, as well as the patriot, will certainly see in it much room for their heartiest efforts. For it is not the emigrant alone, that needs a home, but the native citizen himself equally feels the want of an abode suitable to his taste and his necessities.

On the outskirts of our cities are always to be found cheap lands suitable for cottages, such as we would desire to see our suburbs embellished with. Those lands might be secured, in the whole tract, by coöperative joint-stock companies, of which we are glad to see there are many now in active existence in New York, and we hope to see them in every one of our large cities. Such blocks of land could be conveniently and elegantly laid out in lots having, uniformly, gardens in front all of one depth. This plan has been carried out in many of the avenues in Detroit, and adds breadth and beauty to their appearance.

Efficient drainage, dryness, and general healthiness should be the chief objects in the selection of a site for the erection of a cottage; and where a number are to be built, on an entirely new site, they should be so placed, as not to interfere with, or injure the effect of the surrounding scenery.

The cottage should be so placed that the sun may shine on the most frequented sides of the house, or, if possible, let all the windows have a certain proportion of sunshine through the day. The design and its features should be so arranged, as to have that effect. And every cottage should have a garden attached to it, of not less than about one-

sixth of an acre, to be cultivated by the cottager. It should be neatly fenced, on the front especially, so as to add as much as possible to the landscape effect; and if a hedge-row be introduced, so much the better.

The division of lots should be marked by an evergreen hedge; and, until such hedges can be grown, a neat wire fence might be used to advantage.

The first thing to be done, in laying out the foundations, is to see to the *drainage*; and this is a point of the utmost importance, as upon it mainly depend the health and comfort of its inmates. And not only is it requisite, that the drainage be perfect, but it must be as little liable as possible to get out of order; and when disturbed for the purpose of cleaning, should be capable of reinstatement with the materials at first used.

Although a complete system of drainage would seem to have but little to do with cottage building, the general use of a tank for the common cesspool is most desirable—and the more especially, as in cases where a number of cottages are erected, one tank might serve the purpose of the whole.

The most essential points to be attended to, in the drainage of buildings generally, are the following: All *main sewers* should be formed with concave bottoms, to allow the water, however small in quantity, passing along with solid matter, to act with the utmost possible effect; and they should be evenly built. They should have arched tops, although flags, well laid, make a good cover. Sewers should have a *fall* of not less than one inch in every ten feet in length, and more than this, in all cases, where the flow of water is variable. They should have a constant flow of water through them, or powerful flushes at stated intervals; and particular care taken to ventilate them.

To prevent the foul air generated in, or returning by the drains, the waste-ways should be double-trapped, by a

bell-trap at the sink, where the waste water enters; and by a well-trap short of the inlet to the drain.

All drains should be so constructed, as to admit of being opened for the purpose of cleansing, without breaking them, and of the displaced portion being afterwards replaced.

Each cottage should be provided with the means of collecting and filtering the rain-water from the roof; and thus be independent of any other supply, the more especially, as rain-water is the purest of all water.

WALLS.

The Walls of cottages may be formed of a great variety of materials, and the nature of the material used is a fertile source of variety and beauty.

Wood is the most susceptible of architectural ornamentation at the least expense. Some persons object to it, as requiring frequent painting, being combustible, and perishable.

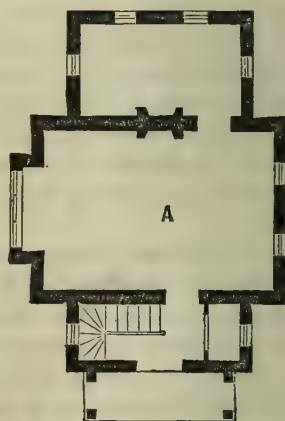
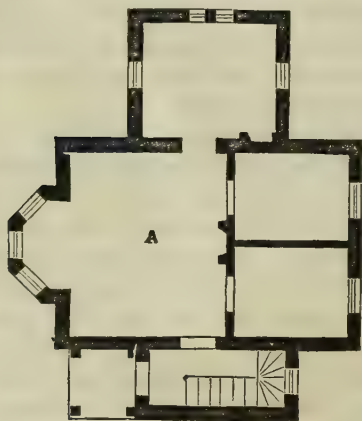
Stone or brick foundations are always

to be recommended, even where cellars are not to be used; and by keeping the wooden frame well up from the ground, the objection as to perishability may be greatly lessened.

The walls are either *clap-boarded* or *vertical-boarded*. A very tasty effect may be produced by clap-boarding, say two feet six inches high, and shingling the remainder, up to the eaves; the shingles to have the corners cut off, to any desired shape; or slate can be very advantageously substituted, and so arranged, as to produce a very pleasing effect, and at about the same cost.

The accompanying designs may be constructed in either stone or brick. The walls, if of stone, should be fourteen inches thick; and, if of brick, eight inches.

The plan is arranged thus: The Living-room, marked A, has two bed-rooms at its rear, kitchen on the left, and hall entrance on the right. The second, or half-story, gives bed-rooms over each of these.





TWO SMALL GOTHIC CHURCHES.

The other plan makes the Living-room A the whole size, omitting the two bedrooms. The house is smaller than the preceding one.

The illustrations following those are of a superior class of Dwelling, suitable for a merchant, shopkeeper, artisan, or clerk. A is the parlor, with its Bay-

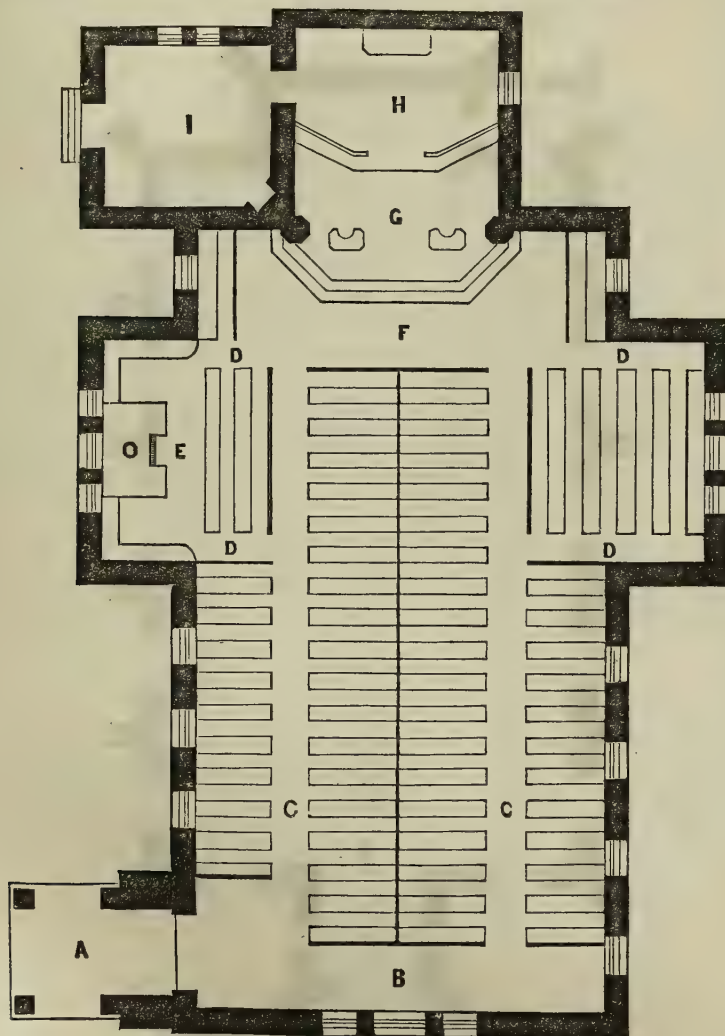
Window, J; B, the Dining-room; C, the Kitchen with its shelved Pantry, H; D, the Hall; E, the Vestibule; F, Staircase; G, Chamber; I, Porch.

The second story: A A A A, Bedrooms; B, Hall; C, Dressing-room; D, Bath-room and Water-Closet; E, roof of Bay-Window.

COUNTRY CHURCHES.

THERE is nothing which, to a traveler, so distinctly indicates the character of a community, as the ap-

pearance of its churches. The smallest village may be judged in this way. Now, as all our people, whether residents of



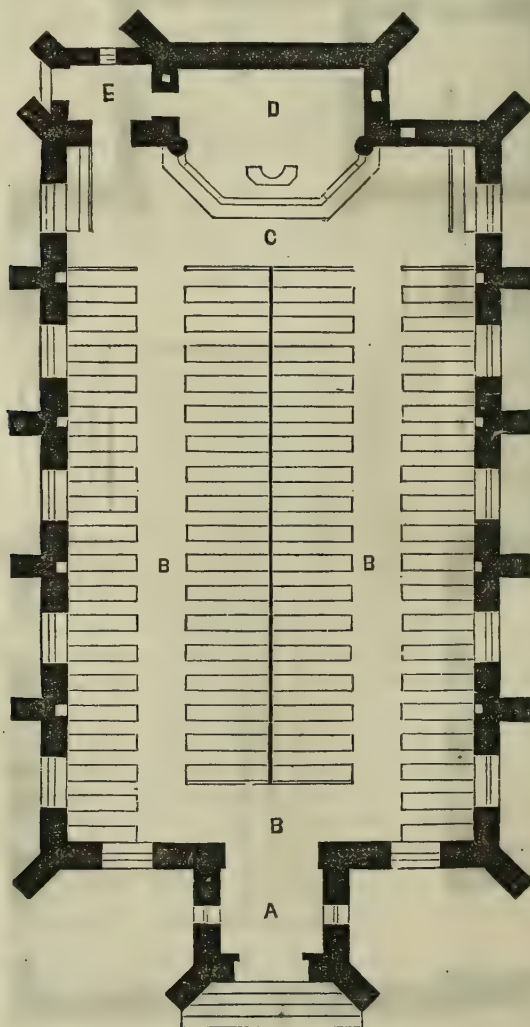
the populous city, or the rural hamlet, are concerned in this judgment, it becomes a matter of some moment to them, to display their best features of taste.

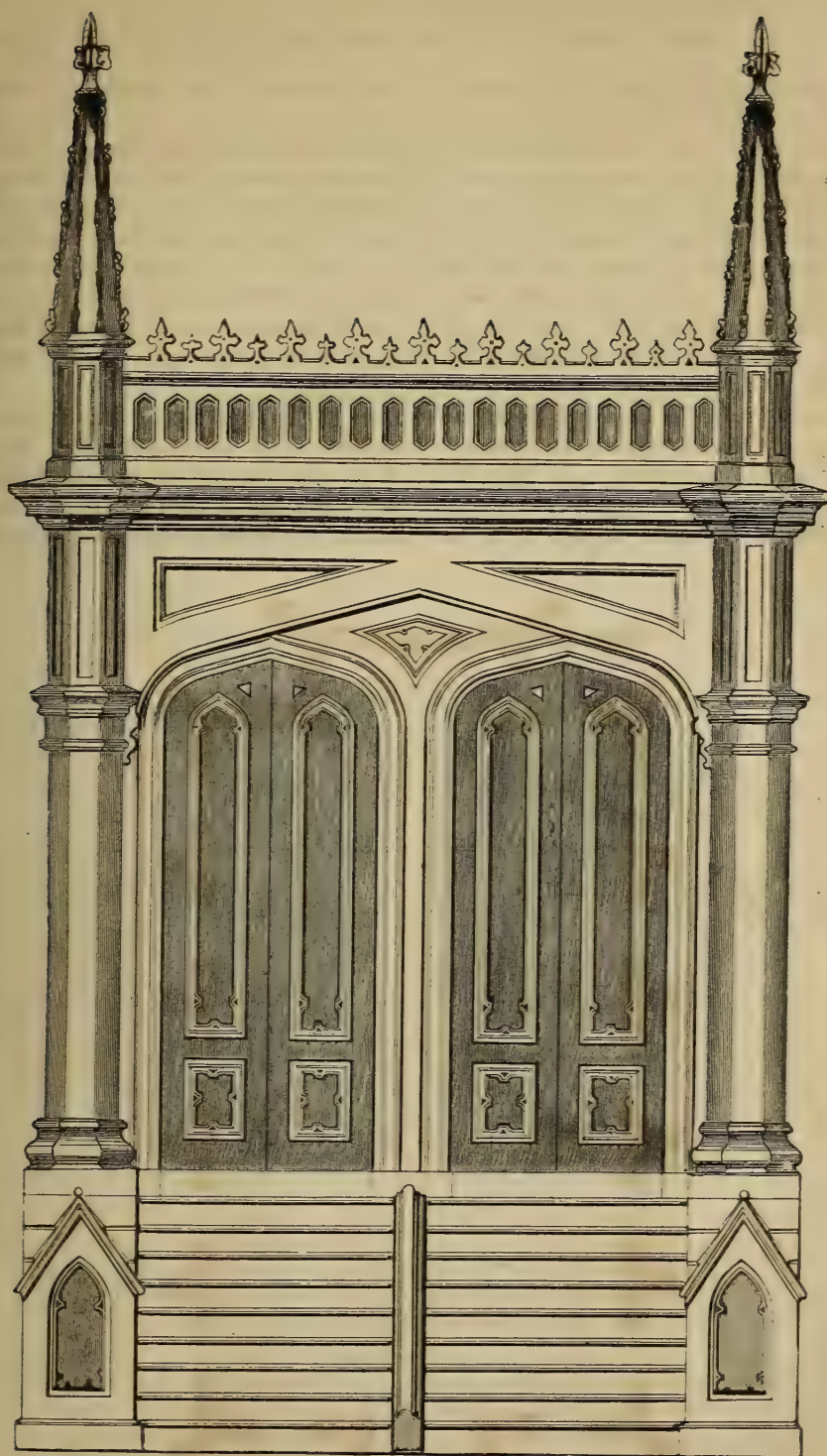
In passing through the country, there is nothing so offensive to one, who seeks for charms, as to find preposterous ugliness defacing the beauty of nature; and this is, unhappily, but too often the case. The country church is apt to occupy a prominent position, so as to be *the* object in the landscape. How charming might that rising object be made! How worthy of Nature, and Nature's God!

There is, we think, a wide field for

improvement, in the designing of Village Churches; and now that the various inventions of man, for overcoming time and distance, have placed our professional friends in an accessible position, so that they can be reached from any quarter whatsoever, we fervently hope to see many gems of genius sparkling in the sunny scenery; and redeeming the barbaric abuses we have yet to complain of.

As the mission of our publication is to disseminate taste among all classes of the land, we present the accompanying simple designs for Country Churches, which, at the same time that they are





TWIN DOORS ADAPTED TO THE TUDOR GOTHIC DWELLINGS.

under the controlling influence of architectural art, can be constructed, if not for less, at least for the same cost, that is incurred in the erection of those strange incongruities, with which ignorant effort has so marred the appearance of the country.

The first design is for a Country Church, of the more expensive class. It is cruciform, with a Vestry Room attached to the Sanctuary. A is the Porch; B, Hall; C C, Aisles; D D D D, Transepts; E, the Organist's Seat; F, Chancel; G, the Communion Table; H, the Sanctuary; I, Vestry Room.

The Elevation is attractive. The situation of the open porch, with the buttress-belfry rising behind it, and flanking the church, gives an advantageous display of the Gable end, with its triplet window. The projecting Transept is a desirable feature.

The material should be rubble masonry, with trimmings of chiseled or

punched stone of a lighter tint. The Roof should be of slate, laid in ornamental courses.

The Second Design is for a Country Church, of less capacity. A, is the Porch; B B B, Aisles; C, the Chancel; D, the Sanctuary; E, the Vestry.

The Elevation is unique. The open belfry supported, on either side, by saddled buttresses rising from the Barge-course; the Porch with its graceful finial terminating in an iron cross; and the Church itself—with its dwarf buttresses and deep water tables—all go to present a design of simple, yet impressive appearance, which, executed in rough-hammered stone, with chiseled facings, cannot fail of giving satisfaction. The monotonous appearance of the roof is avoided by the introduction of sharp, angular dormers, which will, however, be used only as *ventilators* on the inside.

Both of these Churches can be made to suit the services of any denomination.

PRACTICAL CARPENTRY & JOINERY.

DETAILS OF ENTRANCE DOORS

FOR

DOUBLE HOUSES.

THIS plate exhibits the doors of the foregoing TUDOR-GOTHIC DOUBLE DWELLINGS, drawn to a large scale, such as should accompany all working drawings made to full size; and which might be termed a *working scale*.

The First Figure shows the construction of all the parts; and the Second displays the principal features, full size; from which workmen make all their moulds, for the execution of the respective parts. The scale drawing explains the manner of connecting all those parts.

The Door-Piece is constructed of stone, as described in the SPECIFICATION.

The shafts or piers are octagon, and in one stone each, with base, cap, cornice, and balustrade, together with crocketed pinnacles. The steps are seven and a-half inches rise, by fourteen inches wide, with moulded nosings. The side buttresses are to be capped and weathered, as indicated. The Platform is of good width, and the Door-Sill sunk in the frame, of the same form with the jambs, in order to make a deep recess for the door. The side jambs and head are paneled and moulded.

The Door-frame is made of scantling and of walnut.

We now come to the subject of the

Door (derived from the Saxon word *dor*, the Gate of a House, or the passage into an Edifice); and will briefly describe the construction of doors, as well as the preparation of the aperture or opening, that in outer walls is formed by the mason or bricklayer, wherein is the door by which the entrance is to be secured; together with the matters appertaining to the carpenter's department.

The proportion of the aperture must always be in accordance with the size and intention of the building, and should receive every consideration, since it is, in every instance, the principal feature of the edifice. As a general rule, the ratio is *one to two* for large doors, and *three to seven* for those of less size.

In Public Buildings where great concourses of company collect, the entrance doors should be of much greater width, than are those for ordinary dwellings. In the latter case, when they are in single leaf, they should not be less than double the width. VITRUVIUS, in his fourth book, prescribes rules for Attic, Ionic, and Doric doors, all of which have the apertures of the doors wider at the bottom than at the top. Examples of this shape may yet be seen in the ruins of Pallas Minerva, at Athens, as well as at the Temple of Vesta, at Tivoli, and in other Greek and Roman remains.

These doors possess the advantage of shutting themselves, to which they probably owe their invention. They might be conveniently adopted in modern houses; as they rise in opening and will clear the carpet; and, when shut, they go clear down to the floor.

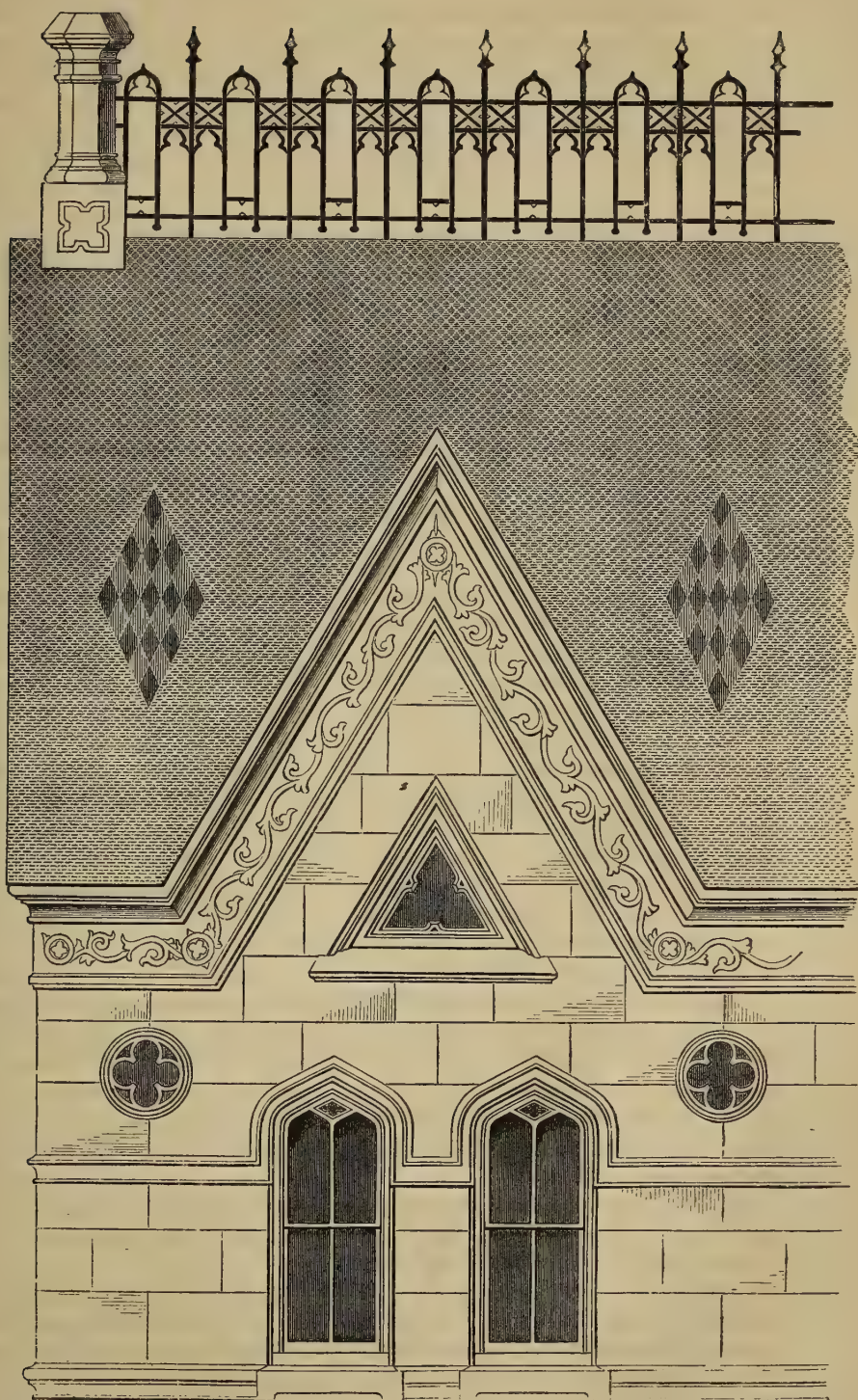
In the principal rooms, throughout the interior of a building, the doors should be placed at least two feet from the return of the wall, so as to admit of furniture being placed close up in the corner. The heads of the doors should always range with those of the windows.

Vestibule doors are in all cases introduced into good houses. They are set back from the entrance doors, as far as circumstances will permit, without encroaching on the entrance to the rooms. They are, as a general rule, finished off in equal style to the front doors; and are usually made with glass panels above the lock-rail. Nothing can be more elegant than this inner or vestibule door finish, when carried out in a style commensurate with the general finish of the house on the inside. It is more subject to critical examination, probably, than any other part of the building; for the reason, that a person whilst awaiting admittance is apt to give attention to this little entrance-chamber, called the vestibule, and make up his mind, as to the taste of the whole composition, from this one small specimen.

The material of which vestibule-doors are composed should be some superior class of wood, such, for instance, as black walnut, rosewood and black-oak, for designs of a sombre composition such as Gothic; and beech, and curled or bird-eye maple, for light styles, such as *Italian, French, &c.*

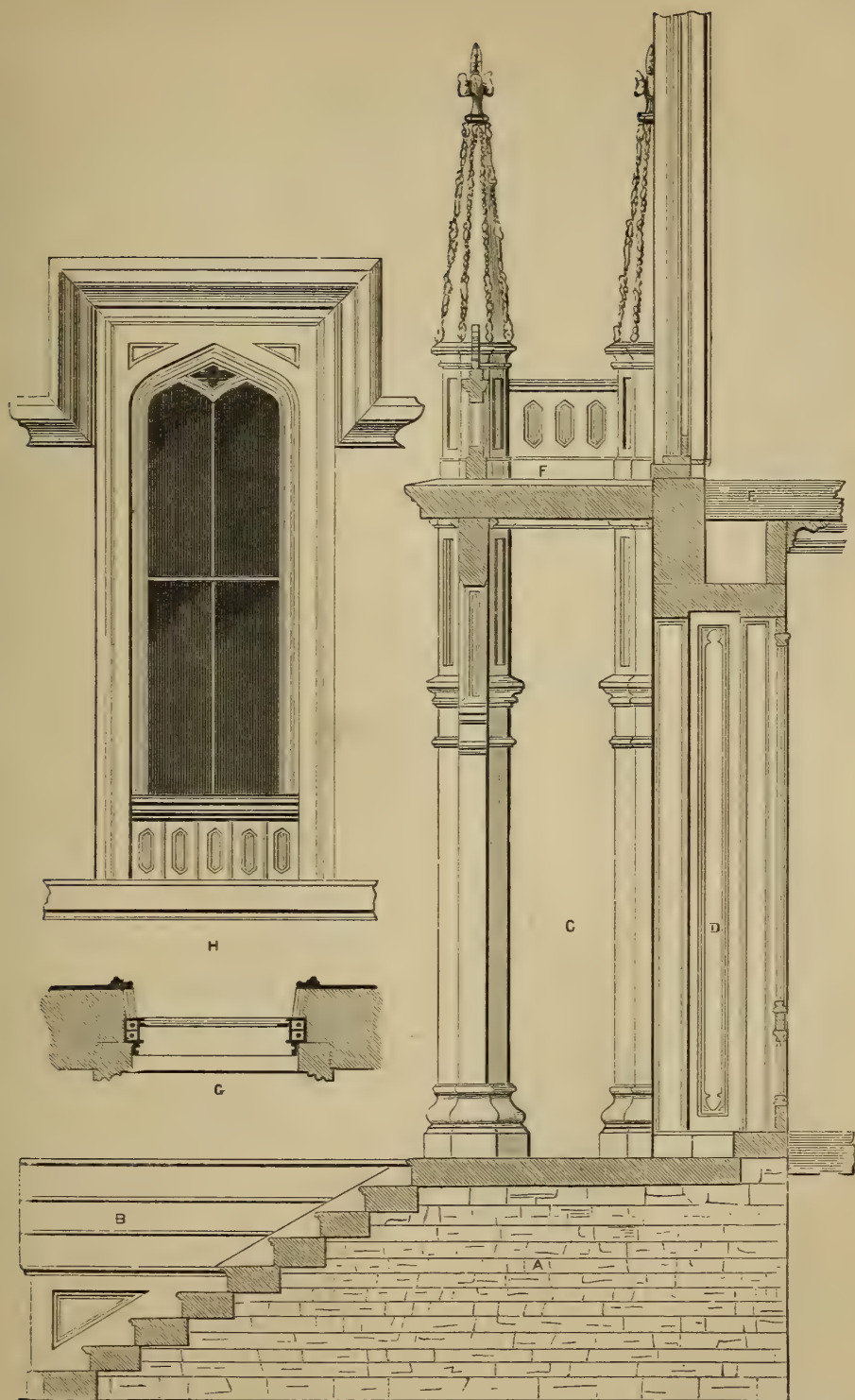
Too much attention cannot be given to the subject of the selection of the pieces to be used in framing. *The heart of the wood of the side-piece should invariably be on the outside.* The reason is simply this: The shrinkage is always towards the heart; and therefore, if the opposite side be framed into it, the injury from shrinkage is avoided. This will be found true in all cases; and the observance of so very simple a remedy may save many an otherwise good piece of work from the fearful effects of shrinkage.

The joinery of the interior finish of some of the best buildings in New York; is a sad example of the effects of shrinkage.



W. R. WEST: SC.

DETAILS OF TUDOR GOTHIC TWIN BUILDINGS.



DETAILS OF THE TWIN TUDOR GOTHIC DWELLINGS.

CASEMENT WINDOWS.

CASEMENT Windows are such as open on hinges, like shutters; and are far cheaper than any other windows. They are mostly made to open inwards; and offer the advantage over the ordinary lift-sash of greater ventilation when open, and no meeting-rail across the middle of the sash when shut, as in other windows.

When properly constructed, casement sashes are tighter, admit less draft, and do not rattle in the wind.

The objections to casement sashes are twofold: one is the difficulty of excluding the rain from the crevice between the sash and the window-sill; the other, their liability to swing to and fro, when open, and the difficulty of so regulating them, as to admit a greater or less quantity of air. These objections have been completely obviated by an improvement made and patented by DR. E. C. EVANS, of Montgomery county. This improvement consists simply of a movable sill, which is interposed between the bottom edge of the sash and the permanent sill of the window frame. It is made of a strip of wood, or metal, four or five inches wide, which extends across the sill; and is so constructed, as effectually to exclude the wind and rain.

The advantage that this weather-strip has over others is, that in it there is one piece extending across the width of the window, thus breaking the joint between the two sashes. It is by this joint—which is unbroken in all other weather-strips—that the greater part of the rain-water enters.

This weather-strip has been in successful use, for more than two years.

A model may be seen at this Office.

The Casement-Sash is a very desirable feature in Domestic Architecture; and it has been long a source of perplexity to the profession, how to manage this

favorite feature, without incurring the *weather penalty*. But now we see the way clear; and thank Dr. Evans in the name of all designers of Gothic, Old

Fig. 1

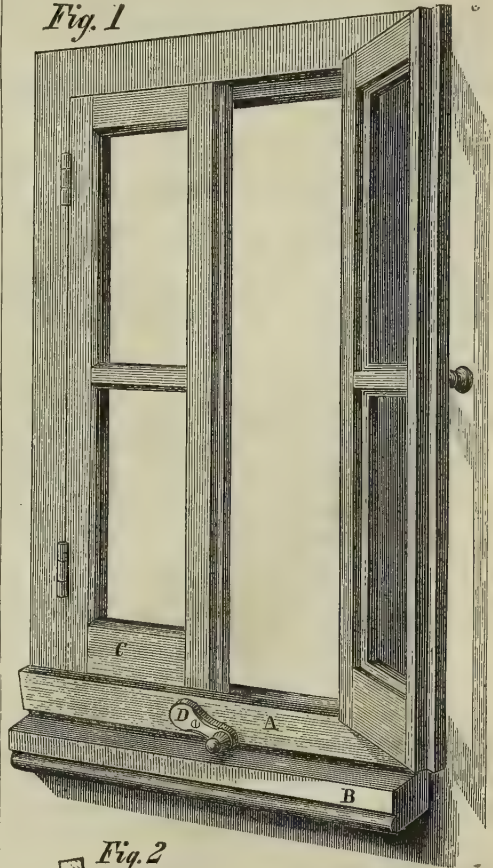


Fig. 2

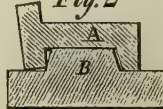


FIG. 1.

- A, The Slip.
- B, The Window-Sill.
- C, The Bottom Rail of Window-Sash.
- D, The Button-Lift.

FIG. 2.

- A, The Slip.
- B, Window-Sill.

English, French, or Italian styles. We consider it a very neat as well as a very useful addition to the accessories of modern dwellings.

SPECIFICATION

OF THE

*Workmanship and the Materials required in the Erection and Construction of
a City Dwelling in the City of Philadelphia.*

GENERAL DIMENSIONS.

The Building is twenty-five (25) feet front by sixty-three (63) feet deep, and three stories high, with a basement, and attic rooms within the roof, lighted with dormer windows on the front and rear, and a window in each gable.

HEIGHT OF STORIES.

The basement will be nine (9) feet; the first story fourteen (14) feet four and a-half ($4\frac{1}{2}$) inches; the second thirteen (13) feet one and a-half ($1\frac{1}{2}$) inches; and the third twelve (12) feet ten and a-half ($10\frac{1}{2}$) inches, all from floor to floor; and the attic will be nine (9) feet in the clear. For the internal arrangement of the several stories, reference is to be had to the plans upon which all the dimensions are figured.

EXCAVATIONS.

The basement will be excavated to the required depth to make the story nine (9) feet in the clear, when finished. The area on the rear, which is eight (8) feet wide, will be six (6) inches deeper than the basement floor. All trenches for foundations or footings, cess-pools and drains, are to be dug out to their required depths.

The earth must all be carted from the premises, and the grounds cleared up of all rubbish and refuse material at the completion of the building, and the whole left in a condition ready for occupancy.

MASONRY.

The walls of the cellar will be constructed with the best quality of quarry building-stone; the footing-course to be through stone, well and solidly bedded

in mortar;—all stone to be properly hammered and laid close and level, well banded and flushed in.

The exterior face of all the stone walls that are in sight must be properly faced and painted.

The mortar for the masonry will be composed of clean sharp sand and fresh lime; and the inner facings of all the walls will be dashed flush with the same material. All those walls which come into contact with the ground are to be coated on the outside with a full coat of hydraulic cement.

CONCRETE.

The whole of the basement and cellar floor is to be coated over with a bed of concrete, composed of broken stones and liquid cement, laid four (4) inches thick, and coated over the top to a smooth surface.

The sleepers for the kitchen floor will be bedded in the concrete, eighteen (18) inches apart, and projecting about a half ($\frac{1}{2}$) inch above the surface.

CUT-STONE.

The entire front will be cut-stone, and done with the best quality close fine-grained stone, of an uniform color, dressed and set in the best and most workmanlike manner, agreeably to the design and working drawings; and all to be pointed and cleansed off, and also polished, except what is hereafter mentioned.

The chimneys above the roof are to be stone, and to have caps, as indicated by the elevation, properly clamped, &c.

The gables and the area walls are to be coped with tooled coping four (4) inches thick, and fifteen (15) inches

wide, with three-quarters ($\frac{3}{4}$) of an inch wash, cramped, leaded and bedded in cement.

FRONT STEPS AND DOOR-PIECES.

The front steps and door-pieces are all to be put up complete, in accordance with the design and working drawings made for the purpose; the steps will be moulded, and also moulded solid string with paneled spandrel, pedestals, rail and balusters complete. The octagon shafts to the door-piece will be in a single stone, with base and cap, with Tudor arch with panels in the spandrels, supporting a cornice above it. The balustrade above this cornice is pierced through with a cap and Tudor flower, as indicated. The octagon shafts are terminated with pinnacles crocketed, with foliated finials. The returns, or jambs, of the stone work are eighteen (18) inches in the doorway, and paneled with mouldings. The base of the building is plain ashlar, eight (8) inches thick, and two (2) feet high, capped with a string-course that is continued around the windows, with a sub, at the bottom, four (4) inches high and one and a half ($1\frac{1}{2}$) inch projection.

The upper section of the base, from the string-course to the water-table, will be paneled, sunk two (2) inches, moulded and cusped; the water-table will also be moulded along the bottom, with a wash above.

The windows of the first, second and third stories will have moulded jambs, with eight (8) inch reveal, and labeled heads. The third and fourth story window-heads will be connected; and all the sills will be moulded; and the fourth story formed into a continuous course.

The first story windows will have open work between the jambs, as these frames and sashes continue to the floor.

The oriel window, in the second story, will be constructed in accordance with the design and the drawings made to a large scale; the whole will be well cramped together, as well as to the walls

of the building, and finished with a balustrade above.

The quatre-foil panels, in ashlar, below the eaves, will be sunk four (4) inches and moulded.

The gable and the cornice will be enriched with foliage, and executed in the very best manner.

No ashlar will be less than six inches thick, and properly cramped to the walls wherever it is found necessary.

The window heads and sills on the rear will all be plain, and tooled, as also the rear door-sill and head, and area steps.

The cellar windows will all have sills, and be finished with arched heads, with the string-course carried around them. The reveal to these will also be eight (8) inches.

A coal-slide will be constructed with proper grade, with a three (3) inch flag-stone, top and bottom, well bedded in cement, with an iron cover, on the top, secured on the inside with hooks and staples.

THE BRICKWORK

Will be built up behind the ashlar and other stone-work on the front, to the required thickness of the walls, agreeably to the drawings and the figures thereon, with well-selected hard brick, and laid with close joints in the best manner.

The rear front to be faced with the best quality pressed brick, of an uniform deep red color, all laid in running bond and white putty mortar, and tuck-jointed.

All the residue of the brick-work throughout the building must be done with the best hard burnt brick; all throughout the basement, including the outer wall as high as the area, must be built in cement.

Piers will be built with arches in the cellar, to support the partition walls above, and an arch for the vestibule floor.

Ash-pits will be built to each of the chimney-stacks, with arches for the hearths, and trimmer-arches will be

turned for all hearths above the first story

All flues are to be constructed, as indicated by the plan; and as may be directed during the progress of the work. All that are not lined with tin, or other metal, must be well pargetted on the inside, and built uniform in size throughout. Indents to be left in walls, where directed, for inserting pipes, tubes, or for any other purpose that may be directed.

All walls to be prepared for the Plumb-ers, Furnace, or Gas-fitters; and all damage done, during the progress of their work, must be made good upon completion of the same.

All brickwork to be executed with mortar composed of clean river sand, and fresh lime, duly proportioned.

The front pavement and the area in the rear will be laid with the best blue flagging. No stone to be less than three (3) inches thick nor less than six (6) feet long by four (4) feet broad, squared and axed on the face to a true surface, and bedded evenly and solidly in mortar.

The curb will be granite, eight (8) inches in thickness, and two (2) feet in width, with the usual stone gutters, as required by the City Ordinances. A blue-stone hearth will be laid to the kitchen fire-place, eighteen (18) inches wide by five (5) feet six (6) inches long, squared and ruled to a smooth surface.

CARPENTER WORK.

The joists of all the floors will be three (3) by twelve (12) inches, and placed sixteen (16) inches between centres, and all backed with one course of lattice bridging, through the centre of each tier; and all solidly blocked upon the walls, over the whole surface of their bearings.

All trimmers for hearths, stairways, and other purposes will be framed, and well secured together. All that will have more than one tail-joist will be double thickness, pinned together, or cut six (6) inches thick, for that purpose. When it is necessary to avoid

mortising, to preserve the strength, in such case iron stirrups will be used for the supports, and joist-bolts to secure them together.

Wall-plates will be required on the walls, four (4) by ten (10) inches, and bedded in mortar. The rafters will be of the usual taper for such lengths, placed twenty (20) inches apart, and well secured at the heel to a raising-piece; and will bear on a ridge-pole at the apex. The latter will be four (4) by twelve (12) inches, and the former two (2) by eight (8) inches, checked into the joists one inch and securely nailed.

The rafters will be boarded over closely, with mill-worked boards well seasoned and of common quality, to receive the slate.

The dormer windows will be set and sheathed, and otherwise prepared for slate, both on the sides and the roof.

The rear cornice and the dormers will be constructed in accordance with the drawings made to a large scale for that purpose.

PARTITIONS.

All partitions that are of wood will be three (3) by four (4) inch scantling, set sixteen (16) inches between centres, and will have one course of zig-zag bridging, and braced, wherever it may be necessary, to relieve the ceiling below from weight. All door-studs will be six (6) inches wide, in order to get sufficient width for nailing the architrave or dressing. All lintels that cross openings will be set on edge, and the depth will be proportioned according to the width of the opening.

DOORS.

The front doors are made in pairs and two and a half (2½) inches thick, paneled and moulded, as indicated, and hung with five (5) by five (5) inch butts, three (3) to each door, and secured with six (6) inch upright mortice rebate locks, with night-latch and bronzed furniture.

They will be further secured with French double-acting bolts. The frame will be two (2) inches by eight (8) inches, finished with a two (2) inch bead, and made with Gothic arch-head.

The vestibule doors will be two (2) inches thick, and also made in pairs, with glass above the back rail, moulded on both sides, and paneled with mouldings below.

The frame will be made of four (4) by eight (8) inch scantling, moulded on each face, and made with a Gothic arch head-light over it.

The sliding doors will all be two and a half (2½) inches thick, paneled and moulded on each face; and hung with six (6) inch sheaves and iron way at the head.

All single doors, throughout the first and second stories, will be one and three quarter (1¾) inches thick, paneled and moulded on each face, and hung with four (4) by four (4) inch butts, and secured with four and a half (4½) inch mortice locks. The third story, the attic, and the basement, will be one and a half (1½) inches paneled and moulded, and hung with three and a half (3½) by three and a half (3½) inch butts, and secured with three (3) inch mortice locks. The closet doors throughout the house will be one and a half (1½) inches thick paneled and moulded, to correspond with the room doors. All the jambs of the doors will be one and a half (1½) inches thick, well secured to the studding and wall-plugs, and let into the floor.

WINDOWS.

All the windows of the first and second stories, including the oriel windows, will be made for sashes, one and three-quarter (1¾) inches thick, and double hung with strain-axle pullies, of large size, and best patent hemp cord. All the other windows will be similar except that the sashes will be one and a half (1½) inches thick.

The basement windows will require

outside shutters one and a half (1½) inches thick; three (3) panels, moulded on one face, and bead and butt on the other, hung with hooks and straps, and secured with eight (8) inch shutter bolts, with rings, staples, and back-holders. All the other windows will require inside shutters in three (3) folds to the jamb; the centre-flaps will be Venetian pivot-blinds, and the jamb-shutter paneled and moulded on one face, with bead and butt on the other, all four (4) panels high and cut in the centre, hung and secured in the usual manner, and made to fold into soffits constructed in the jambs for that purpose.

CELLAR WINDOWS.

The cellar windows will all have solid frames made for sash one and a half (1½) inches thick, hung with butts, and secured with small bolts. All these windows will require neat iron guards secured in the jambs; one of these will swing, and be secured shut with a bolt, hasp, and padlock on the inside.

DRESSINGS.

The dressings of the first story will be of eight (8) inches wide moulded architrave, and seven (7) inch washboard with three (3) inch sub, and two and a half (2½) inch moulding planted on the top; and will unite with, and form the back member of the architrave. The second and third story architraves will be six and a half (6½) inches wide and moulded.

The washboard in these stories will be five and a half (5½) inches wide, with three (3) inch sub, and two (2) inch moulding, all butt to the architrave. All the remaining dressings will be four and a half (4½) inches wide, moulded, and the washboard eight (8) inches plain, with one and a half (1½) inch moulding planted on the top. All windows will have panel backs, with elbow jambs paneled and moulded, in keeping with the finish of the rooms.

The basement and attic stories will have plain window-sills with moulded faciae.

STAIRS.

The main stairs will be continued from the first floor to the Attic, and be constructed with best quality heart-pine step-boards, tongued, glued, and blocked to the risers, and let into the wall-string. The rail will be four and a half ($4\frac{1}{2}$) inches moulded, and the balusters two and a half ($2\frac{1}{2}$) inches, and the newels ten (10) inches, all neatly turned. The shaft of the newel will be octagonal in form, paneled and moulded. The bottom steps will be curved outwards six (6) inches, and the side finished with paneled spandrels, with a door and fitted up with a closet beneath. The private stairs will be constructed in the usual manner for such stairs, and will extend from the basement to the third floor, with doors at each landing.

FLOORS.

All the floors will be laid with the best quality, or No. 1, heart Southern pine boards, mill-worked and well seasoned, none over three (3) inches in width and one and a quarter ($1\frac{1}{4}$) inches thick, all smoothed off after being laid.

CLOSETS.

All closets throughout the building will be fitted up and fully shelved, and furnished with pin-pails with clothes hooks, wherever necessary.

A dresser will be fitted up in the kitchen, with dwarf-panel doors, top and bottom; and drawers in the middle. The butler's pantry will be fitted up with shelving, a draining rack, a nest of drawers and cases for spices, &c.

All the materials for the foregoing to be of the best of their respective kinds, and the carpenter work to be done in a good and workmanlike manner; the lumber to be well seasoned, and free from defects of any kind.

ROOFING.

The roof will be covered with best slate of medium size and of varied pattern (laid on felt), with at least three (3) inches overlap, and secured with iron nails boiled in oil. All gutters, valleys, and flushings to be of the best quality single cross tin, with the joints soldered on both sides, and painted one coat beneath and three coats above, all of slate color. The leaders will all be corrugated and put up securely with copper, or double cross tin, socket pipes from gutters, and be furnished with globe basket covers over them. The lower length of the leader to be of cast iron with a shoe.

PLASTERING.

All the walls and ceilings will be plastered two coats of brown mortar and one coat of white, with marble dust, finished to a smooth polished surface.

The ceilings will all be lathed on the naked joists, and receive one coat of brown mortar. They will afterwards be cross-lathed with furring or shingling lath, placed sixteen (16) inches between centres; the ceilings are then to be regularly lathed and plastered.

STUCCO-WORK.

A stucco cornice will be run in the angle of the ceiling of the rooms of the first story, to girt eighteen (18) inches, all of plain mouldings, without enrichments. An oval centre-piece will be required in the front and rear rooms three (3) feet long and two (2) feet wide; the one in the centre room will be circular, two feet in diameter. A cornice will be run in the hall and vestibule, to girt fourteen (14) inches, all of plain mouldings, with centre flowers for the gas-drops. A cornice will also be run in the second story rooms, to girt fifteen (15) inches, and one in the third story to girt twelve (12) inches; this latter applies also to the hall of second and third stories.

The mortar for the plastering will be

composed of clean river sand and fresh lime, duly proportioned.

All lath to be sound and free from bark.

PAINTING AND GLAZING.

All woodwork that it is usual to paint will require three coats of best white lead and linseed oil, done in such tints of plain colors as may be desired. The basement and the butler's pantry will be grained in imitation of oak and varnished twice over with the best varnish.

All walnut wood will be varnished three coats, and rubbed to a smooth surface.

GLAZING.

All the front and side windows of the first story will be glazed with best French plate glass; the rear of this story and the front of the second story will have double-thick crystal-sheet glass; and the residue of the front and flank and rear will be single thick.

The basement and kitchen will be best American, and the cellar windows third quality

The vestibule doors and transom will be French plate; and the skylight in the roof over the stairs will be glazed with extra thick ribbed glass. The ceiling-light to the same will be embossed glass, of ornamental pattern, to cost not less than three (3) dollars per superficial foot.

All the glass to be well bedded, bradded and back puttied.

The size and number of all the lights can be obtained from the drawings.

The owner will have the privilege of furnishing the enameled glass, and deducting the amount from the contract.

HARDWARE.

All locks, bolts, hinges, &c., as specified under the head of Carpentry; and all other material, that may be needed and is not herein specified, to be of good and approved quality. The furniture to all the first-story doors, including the hinges of front and vestibule doors, will

be bronzed and of antique design. The furniture for the upper stories will be of white porcelain throughout. Every thing necessary to complete the Building in all its parts will be provided and supplied, in accordance with the plans and specifications.

PLUMBING.

The service-pipe will be attached to the main in the street with three-quarter inch ferrule, and conveyed to, and distributed throughout the House, as follows: To the water-back of the kitchen range, and circulating-boiler which is connected to the same: an iron sink will be set in the kitchen of medium size, with hot and cold water supply, and large waste to discharge into drain-pipe. The butler's pantry will be fitted up with a butler's sink of copper tinned, with a supply of hot and cold water and large waste.

The bath-rooms on the second and third stories will be fitted up with tubs lined with copper tinned, and have hot and cold water supply with large waste to discharge into soil-pipe. The one in the first story will be fitted up with a shower over it. The tubs will be paneled and moulded with cap on the top; the bath-rooms will be wainscotted four feet high around the wall; also neatly capped; and all of walnut wood.

Water-closets will also be fitted up, at the side of each of the bath-tubs, with six-inch soil-pipe, to be continued down to the cellar, and discharge into a well prepared for that purpose. The water-closets to be of the best pan pattern, with iron container and reservoir to each, all fitted up in the best manner with seats, risers and hinged lids, all of walnut wood.

Wash-basins will be fitted up in each of the bath-rooms, with marble-top stands, counter-sunk, with backs, with hot and cold water supply, and large waste, with trap to discharge into the soil-pipe. All the fixtures in the bath-rooms and butler's pantry will be silver-

plated, and fitted up in the best manner. The wash-stands will be walnut, fitted up with closets beneath.

A wash-pave will be required on the front and a cedar hydrant in the yard, each to have a hose screw nozzle.

All material for the plumbers' work must be of the best quality, and extra strong pipe; the workmanship to be done in a good and workmanlike manner.

GAS-PIPE.

The pipe for the introduction of the gas will all be concealed beneath the plastering, and of the requisite size for the following number of burners: six (6) in front parlor; four (4) in library, and four (4) in dining-room; one (1) in vestibule; one (1) in hall; two (2) in each chamber of the second and third stories and one (1) in each of the rooms above; and one (1) to each bath-room, and second and third story hall; two (2) in kitchen; (1) in each Pantry, and one (1) in cellar; all fitted up, tested, and left in a condition ready for the meter and fixtures.

BELLS.

Eight (8) bells are to be provided and hung with strong copper wire and tin tubes.

The front door-pull to be bronzed, to correspond with front-door furniture; all the residue to have lever-chain pulls, with proper cranks, four of which will be bronzed, and the rest porcelain.

SPEAKING-TUBES.

A speaking tube will be provided, and fitted up, from the butler's pantry to the kitchen, with mouth-piece and cover.

FURNACE.

A large size furnace will be set in the cellar, of an approved kind, enclosed in a brick chamber, with tin pipe, to convey the hot air to the separate flues, and the gas through terra-cotta pipe to the chimney for that purpose.

All registers to be of the best kind:

those for the first and second stories will be bronzed, and the others japanned. Each room will also require a ventilating register, white enameled.

RANGE.

The range in the kitchen to be of medium size, with water back; built up with pressed brick, and a polished stone-slab hearth. The circulating boiler, of forty gallons, will be galvanized iron with copper connections, with the water back, set on an iron stand; all fitted up in the best manner. The range to be so constructed, as to warm the room over it.

GRATES.

A low-down Grate will be set in the library and dining-room, so arranged as to discharge the ashes into ash pits in the cellar.

MANTELS.

A Mantel will be set in the parlor, not to cost less than two hundred and fifty (250) dollars; one in the library, two hundred (200) dollars; one in dining-room, one hundred and fifty (150) dollars; one in each of second-story chambers to cost one hundred (100) dollars each; the third and upper stories to have three to cost fifty (50) dollars each, all set complete with hearths, &c. The owner to have the privilege of furnishing the mantels, and deducting the several amounts herein specified.

FINALLY:

The Contractor is to furnish all the materials at his own cost, all to be the best of their respective kinds; and all the workmanship to be done in a good and workmanlike manner.

CONDITIONS,

AS A BASIS OF CONTRACT.

The work is to be commenced immediately after the signing of the Contract; and to be completely finished, and delivered over to the owner, by the first day of _____, one thousand eight hundred and _____

The owner shall be held harmless, either in suits at law, or otherwise, from all damages to the property of any other person or persons arising during the progress of the work, or injury to any

person or persons from accidents while engaged on the building; and he shall not be held responsible for materials that may be stolen, or destroyed by fire, during the progress of the work.

THE CONTRACT.

THE WORKING DRAWINGS, SPECIFICATION and BILL OF QUANTITIES are examined by the Contractor, who then makes his estimate; and bids for the work. The successful bidder enters into a formal contract with the projector, who, as a general thing, submits to him the whole work, and pays for it by instalments. This is the usual and best arrangement for most domestic buildings, or those of moderate cost; but in large or expensive private messuages, or in public edifices, different parts of the work are

often performed under separate contracts. For very large structures, such as heavy county, municipal, State, or National works, many other arrangements are necessary. The minutiae of an agreement are varied by different circumstances, and being innumerable, we cannot embody them here. We simply insert a usual FORM OF CONTRACT, drawn up by a member of the Philadelphia bar, which may be relied upon for its accuracy. The italicized words must be changed in using:

ARTICLES OF AGREEMENT

Made this, the *first day of December*, Anno Domini *One Thousand Eight Hundred and Sixty-Eight*, by and between *Jacob Jones*, of the *City of Philadelphia*, and *State of Pennsylvania*, Merchant, of the first part, and *John Smith*, of the *City of Camden*, and *State of New Jersey*, Builder, of the second part, as follows, viz.:

The said party of the second part, for and in consideration of the covenants and agreements hereinafter mentioned, doth for himself, his executors, administrators and assigns, covenant, promise and agree to and with the said party of the first part, his executors, administrators and assigns, that he, the said *John Smith*, party of the second part, shall and will, within the space of *one year* from the date hereof, to wit, on or before the *first day of December*, Anno Domini *One Thousand Eight Hundred and Sixty-Nine*, in good and workmanlike manner, and according to the best of his art and skill, well and substantially erect, build, set up, and deliver to the said *Jacob Jones*, party of the first

part, or his legally authorized agent, free and discharged of all claims, liens, and charges whatsoever, or cause to be erected, built, set up, finished and delivered, as above mentioned, on a lot or piece of ground, situate and being [here insert the description, as contained in the deed; and designate the part of the lot the house is to occupy] one house, messuage, or tenement, according to the plan, draft, or scheme, with specifications annexed, made, drawn and finished by *Free-Hand Sketcher*, Architect, the contents whereof are as follows, viz.: [here refer to the plans and specifications, by numbers or letters, and affix them to these articles, with a contract stamp to each separate piece of paper, as in case of difficulty, or dispute, under the contract, they alone can decide.] And the said party of the second part further agrees, for himself, his executors, administrators and assigns, to furnish, at his own proper cost and charge, all the materials which may be requisite for the construction of the aforesaid house, messuage, or tenement, accord-

ing to the plans and specifications aforesaid; and to insure on his part the performance of this part of these presents, it is further agreed that *John Archer*, of the City of *Myriadopolis*, Carpenter, be and the same is hereby appointed Superintendent, who shall have power to inspect, and accept or reject any work done, or materials it may be proposed to use in or about the construction of the house aforesaid, and whose decision shall be final and conclusive, without question or appeal; as between the parties hereto.

And the said *Jacob Jones*, the party of the first part, as aforesaid, in consideration of the above premises, doth for himself, his executors, administrators and assigns, covenant, promise and agree, well and truly to pay, or cause to be paid, unto the said party of the second part, his executors, administrators or assigns, the sum of *twenty-four thousand and seventy-one dollars and sixty-two cents* (\$24,071.62), good and lawful money of the United States, in eight (8) several payments, in manner following, to wit:

On the *first day of March*, Anno Domini *one thousand eight hundred and sixty-nine*, or as soon thereafter as the walls of the cellar shall have been completed, and the first tier of joists is laid, the sum of *one thousand five hundred* dollars.

When the walls are up one story high, and the second tier of joists is laid, the sum of *one thousand* dollars.

When the walls are up two stories high, and the third tier of joists is laid, the sum of *one thousand five hundred* dollars.

When the walls are up three stories high, and the fourth tier of joists is laid, the sum of *two thousand five hundred* dollars.

When the walls are up to the full height, and the roof is completed, the sum of *three thousand* dollars.

When the floors are laid, and all parts ready for plastering, the sum of *four thousand* dollars.

When the plastering is all completed, the sum of *four thousand* dollars.

And on the *first day of December*, Anno Domini *one thousand eight hundred and sixty-nine*, or as soon thereafter as the building shall have been completed and delivered as aforesaid, the sum of *six thousand five hundred and seventy-one dollars and sixty-two cents*.

And it is further agreed between the aforesaid parties, that all alterations of the annexed plan or specifications, by which the costs of building may be either increased, or diminished, shall be endorsed on these articles and signed by the parties, before they shall be deemed binding on either party.

And for the performance of all and every the articles and agreements, above mentioned, the said *Jacob Jones* and *John Smith*, do hereby severally bind themselves, their executors, administrators and assigns, each to the other, in the penal sum of *fifty thousand dollars*, lawful money, as aforesaid, firmly by these presents.

In witness whereof, the said parties have hereunto set their hands and seals, the day and year aforesaid.

JACOB JONES. [SEAL.]

JOHN SMITH. [SEAL.]

Signed and sealed in the presence of
SAMUEL SLOCUM.

THOMAS QUICKLY.

For the faithful performance of all and singular the covenants, agreements and promises, contained in the above articles on the part of *John Smith*, the party of the second part aforesaid, we do hereby jointly and severally bind ourselves, our executors, administrators and assigns, to the aforesaid *Jacob Jones*, his executors, administrators, or assigns.

Witness our hands and seals, the day and year aforesaid.

HENRY WARD. [SEAL.]

RICHARD BLACK. [SEAL.]

Signed and sealed in presence of

SAMUEL SLOCUM.

THOMAS QUICKLY.

The above contract is complete, and may readily be adapted to suit circumstances. Great care, however, must be exercised in making alterations, or additions, as a false expression might render the whole invalid. In the appointment of a superintendent, or referee, other articles must be signed by him and the parties, binding him for a consideration to the faithful discharge of his obligations. Most frequently this appointment is superfluous, the work being inspected by the owner in person. It is only in case the work be at a distance, or so extensive as to require constant attendance, that the owner need make the transfer. If there are any reservations made by either party, they should be endorsed upon the articles of agreement. The security of the party of the first part is in the same form as

that given above, the names of the parties being reversed. When the work is completed, it is essential that the owner receive a release "of all claims, liens, or charges whatsoever," signed by each and every person who either may have furnished material for the building, or who may have done any labor in its erection; otherwise, after the business between himself and the contractor is finally closed, he may be compelled to liquidate claims, which the other has failed to discharge.

The business of entering into and fulfilling such a contract is by no means easy; and inexcusable carelessness in this is the cause of innumerable lawsuits. By using the above form, and exercising judgment and care in its adaptation, no difficulty need be apprehended.

BILL OF QUANTITIES.

<i>Cellar.</i>	500 yards Excavation, @ 50 cents per yard . . .	\$250 00
<i>Well.</i>	1 Well, 4 feet diameter, and 28 feet deep, @ \$2 25 per vertical foot . . .	63 00
<i>Masonry and Materials.</i>	125 perches of Stone, in Cellar Walls, @ \$4 50 per perch . . .	562 50
	500 square yards Concrete, in Cellar Floor, @ 50 cents . . .	250 00
	800 feet of Ashlar, @ \$2 75 per foot . . .	2,200 00
<i>Cut Stone and Labor.</i>	90 feet of Steps, @ \$4 50 per foot . . .	405 00
	125 feet in Door-Piece, @ \$8 50 per foot . . .	1,062 50
	103 feet in Bay-Window, @ \$6 per foot . . .	618 00
	200 feet Corners, @ \$6 per foot . . .	1,200 00
	113 feet Architrave to Windows, @ \$6 per foot . . .	678 00
	50 feet of Rear Window Sills, @ \$1 50 per foot . . .	75 00
	40 feet of Coping on Area Wall, @ \$1 50 per foot . . .	60 00
	36 feet Area Steps, @ \$2 50 per foot . . .	90 00
<i>Pavement and Curb.</i>	350 feet Front Pavement, @ \$1 25 per foot . . .	437 50
	25 feet Curb Stone, @ \$2 per foot . . .	50 00
<i>Brick and Workmanship.</i>	165,000 Rough Brick, laid in the Wall, @ \$18 per M. . .	2,970 00
	10,000 Press Brick for Front, @ \$45 per M. . .	450 00
<i>Carpentry and Joining.</i>	18,000 feet Joists and Studding, @ \$22 per M. . .	396 00
	2,200 Sheathing Boards for Roof, @ \$24 per M. . .	52 80
	7,000 feet Flooring Boards, @ \$45 per M. . .	315 00
	1 pair Walnut Front Doors and Frame . . .	135 00
	1 pair Walnut Vestibule Doors and Frame . . .	110 00

*Carpentry
and Joining.*

3 pairs Walnut Sliding Doors, @ \$90 per pair	\$270 00
3 Single Doors, of Walnut, @ \$35 each . . .	105 00
16 Six Panel, 1 $\frac{3}{4}$ inch Pine Doors, @ \$15 each .	240 00
28 Six Panel, 1 $\frac{1}{2}$ inch Pine Doors, @ \$12 each .	336 00
11 Front Windows, with Inside Shutters, of Walnut, @ \$32 per Window	352 00
16 Front Windows, with Outside Shutters, @ \$28 per Window	448 00
Framing and setting Joists, putting on Roof, and laying Floors	486 00
Setting Window Frames	68 00
Framing Windows and Doors, and putting down Washboards, including the Ma- terials	685 00
Fitting up and shelving Closets	130 00
Fitting up Pantries and Closets, &c.	96 00
Putting up Main Stairs, including all Material	760 00
Private Stairs	125 00
Rear Verandah, complete	410 00
Hanging Doors	120 00
Hanging Sash and Outside Shutters	145 00
Preparing for Plastering	210 00
Finishing Dormer and Gable Windows	60 00

*Hardware and
Bells.*

Hardware	672 00
Bells and Speaking Tubes	48 00

*Roof Slate and
Tin.*

1,800 feet Slating, @ 14 cents per foot	252 00
175 feet Tin, for Gutters, @ 20 cents per foot . .	35 00
100 feet Rain Water Conductors, @ 25 cts. per ft.	25 00

Plastering.

2,800 yards Plastering, @ 50 cents per yard . .	1,400 00
242 feet Cornice, 18 inch girt, @ 36 cents . . .	87 12
90 feet Cornice, 14 inch girt, @ 28 cents . . .	25 20
400 feet Cornice, 12 inch girt, @ 24 cents . . .	96 00
2 Stucco Centre Pieces, @ \$12 each	24 00
1 Stucco Centre Piece	10 00
2 Stucco Centre Pieces, @ \$1 50 each	3 00

Glass.

Plate Glass	116 00
Crystal Sheet	76 00
American Glass	42 00
Sky-Light on Stairs	68 00
Glazing	65 00

Painting.

Painting, including Materials	580 00
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Plumbing.

Plumber's Work and Materials	986 00
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Gas Fitting.

Gas Pipe	210 00
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Ranges, &c.

Ranges and Circulating Boilers	190 00
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Furnace, &c.

Furnace and Registers	500 00
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Mantels.

Mantels	990 00
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Grates.

Grates	95 00
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LUMBER AND LUMBER YARDS.

BY F. H. WILLIAMS.*

IN connection with architecture and architectural improvements, the subject of the manufacture and proper preparation of Building Materials is of paramount importance; and experience has demonstrated the impossibility of successfully carrying out the artistic design of the architect, without both the intelligent co-operation of the Builder, and the presence of first-class Material wherewith to construct the Building.

First in importance, among the innumerable species of merchandise necessary in the erection of an edifice, large or small, is LUMBER. It enters into the composition of the whole, from the completion of the cellar walls, until the house passes out of the hands of the Builder. It is the article of all others the most indispensable, and although experience has hitherto shown, that Providence always provides a substitute for an article, which increasing consumption renders extinct; yet it is difficult for us to conceive where we are to find a commodity, that shall take the place of Lumber, should a time arrive, when our timber forests are exhausted.

And here it is in place, to call attention to the unjustifiable prodigality and shameless waste manifested in some districts of the United States, where the immense tracts of timber lands have rendered the inhabitants insensible to their enormous value.

Lands having to be cleared for agricultural purposes are stripped of their growths by fire; and millions of feet of Lumber, which, for the uses of manufacture and commerce, are worth fortunes, are thus ruthlessly and wickedly destroyed.

Those who are now burning up our noble pines will discover their mistake, when too late. Just as the farmers of Indiana, who, a dozen years ago, made their post-and-rail fences of the finest

black walnut, are now mourning over their indiscretion, when they behold the marvelous popularity, innumerable uses, and rapidly decreasing supply of this beautiful wood.

In this paper, however, it is our purpose to rather deal with facts as they are, than to raise our voice against any abuses of past or present; and we will therefore proceed to an examination of the processes for preparing Lumber for market; and also of the proper management of a Lumber Yard.

Persons not well informed on the subject have very incorrect ideas of the length of time required for the thorough Seasoning of Lumber. The time that should elapse between the cutting and sawing of the log and the working of the boards for their final consumption varies very widely in the different woods, this difference being caused chiefly by the closeness of the grain, hardness of the wood, and the tenacity with which the pores retain the sap.

So far as a matter so indefinite, and so dependent upon extraneous circumstances, can be reduced to a statistical form, the following table may be referred to as showing the average time necessary for the seasoning of the woods named:

White Pine Boards.....	1 year.
“ “ Plank,	
2 inches.....	15 to 18 mos.
White Pine Plank, 3 inches.....	2 years.
Southern Heart Pine, 1 inch.....	1 year.
Southern Heart Pine, 5-4 inch.....	15 mos.
Black Walnut, 1 inch.....	20 mos. to 2 years.
Black Walnut 8-4 Plank.....	2 years.
Black Walnut Plank, 4 or 5 inch.....	4 years.

Hemlock will dry out sufficiently to be used as joists in from five to seven months, while many Hard woods, such as Oak and Ash, approximate Walnut in the length of time required. The latter is the most difficult to judge of, with any degree of certainty. The writer has seen a 5 inch Walnut Plank, sawed eight years before, which, upon being cut into two equal Planks, was perfectly

* Lumber Merchant, Seventeenth and Spring Gar'en streets.

green in the centre, and from all appearances would have remained so for as many years to come.

And here we find the cause of a great many apparently poor pieces of workmanship in Walnut doors, shutters and even furniture;—the Lumber, so far as can be seen, is dry when bought, and being afterwards cut into smaller thicknesses, the inside surface—which is green—shrinks, while the outer side remains firm, the consequence being a gaping joint. In such instances, the mechanic receives the blame for that, which of right should be laid to the charge of Nature, inasmuch as she hides her realities under so specious an exterior.

WHITE PINE LUMBER of the finest grades, such as manufactured from Michigan logs, should invariably be stripped at the mill, for at least six weeks to two months after being sawed, as its shipment, either by railroad or vessel, before that time, results injuriously, not only to its appearance, but also to its quality. The contact of the wet surfaces of the boards produces a permanent green (in some cases, black) stain, or mildew, which cannot be removed, except by planing deep enough to get below it; and frequently passes into decay, before the lumber is sufficiently seasoned for use.

After it has reached its destination and has been sorted, much care is required in its piling.

Foundations should be laid at least 12 inches high, composed of blocking laid on 3-inch joists, and with the blocks say 8 inches apart, having two thicknesses of joists placed on top of them, in such manner as to "break joints" and give the whole a firm and equal support. There should be one bearing for every four feet in length of the boards or plank; otherwise the distance intervening between the supports, together with the great weight, which the lower courses of the pile have to sustain, causes them to give downwards; and ruins their straightness and elasticity.

The piles, moreover, should be built with a pitch, backwards and downwards, of half an inch to the foot, and a slant forwards and upwards of one foot to every six feet in height.

An observance of these rules—if the pile is properly covered—insures the preservation of the Lumber from the effects of rain, the pitch throwing off the water, and the upward slant making each course the protector of its next neighbor below.

In stripping, the following regulations should be adopted:

1. Strip with as narrow pieces as will suffice to give the boards a firm bearing.

2. Let the strip correspond in thickness to that of the board or plank.

3. Be very particular to place each strip at the same angle from the one under it, as that indicated by the slant of the pile, so that, upon casting your eye up the side of the pile, the ends of the several rows of strips shall form so many parallel and undeviating lines.

4. Allow the front strips to project nearly half their width out from the pile.

5. Never crowd a course, for the sake of getting in an extra board; and always take care, that the sides of the courses are "plumb."

6. Cover the pile with old or culling boards, taking care that they lap at the joints.

The object of the first of these rules is to bring as small a portion of the board in contact with another surface as possible. Green Lumber should never be stripped with boards out of the lot, as the juxtaposition of the two wet faces is certain to cause a stain.

The object of the second rule is to give the wood a fair chance to dry, the amount of air required to season a piece, being in geometrical proportion to the thickness of that piece. In some instances, however, want of space renders carrying out of this rule impracticable.

The object of the third rule is to give the entire pile a proper support and render the pressure equal.

That of the fourth, to afford additional protection from the weather, as well as to give the pile a neat and uniform appearance.

That of the fifth is to prevent the boards from coming into contact at the edge.

That of the sixth, to shield the pile from snow, rain and sun.

A thorough observance of these rules will contribute largely to the satisfaction of the builder; and insure a very considerable saving to the dealer.

A very good invention for drying boards, and one much used in some quarters, consists in a frame or rather horizontal piece, supported by posts, and having a rack formed of cuts, about one inch apart, in which the upper ends of the boards are inserted, and by which they are retained in an upright position. It is found that newly manufactured Lumber will dry out in a much shorter time when standing on end than in any other position; and if the rack is in a situation to receive plenty of air; and particularly, if so placed, as to allow the boards to have their edges towards the northeast winds—it will be found, that the seasoning process is very greatly accelerated.

Artificial Seasoning, while it may prove useful in some cases, is not endorsed by those who are the best judges of its efficiency; and, while it is not wise to indulge in a wholesale condemnation of any system, it nevertheless appears self-evident, to the writer, that the unnatural "forcing" of Lumber, under an enormously high temperature, must tend to render it brash and lifeless, by baking the sap in the pores and boiling the very substance out of it.

Hard woods, and the better qualities of Pine, after having become seasoned, should, if possible, be put under cover.

A shed facing East and West, with the sides open and the ends boarded or slatted, forms the best possible protection. It is not desirable to exclude even the dryest Lumber from damp air.

Experience proves, that March—during which there is such a prevalence of atmospheric dampness—is the best month for drying stock.

When exposed to a circulation of air, there is less danger of dry Lumber splitting, although it is nearly impossible to discover an absolute prevention of this difficulty. It is suggested, that the tacking of plastering-laths along the end-edge of wide plank, and afterwards whitewashing them, is the best preventive in use. Whitewashing is also found to be very efficacious for preserving Spruce, a branch of the Pine family, which, of all others, is the most prone to crack at the ends.

White Pine Plank and Boards will frequently deteriorate in quality during the process of seasoning, or, more correctly speaking, imperfections, which are entirely hidden when the wood is green, become visible, after it has dried out; and, as the best judges are liable to be deceived, it should be subjected to a second inspection, when it is re-piled.

The law is very clear on the subject of the quality of lumber; and distinctly specifies the maximum degrees of imperfection, which shall allow it to pass into the various grades.

"All boards and plank shall be reduced and counted as inch measure, of which there shall be but three qualities, viz.: Panel, Common, and Cullings, that is to say, all boards and plank that shall not have more than three small sound knots, not more than $\frac{1}{2}$ an inch in diameter, without sap, or shake, or any other defect, or being free from knots and not having, on an average, more run of sap than half the thickness of the board or plank, shall be deemed and counted as Panel; and all boards and plank that shall not contain more than three round knots, nor more than 1 inch in diameter, and not more run of sap than half the thickness of the board or plank, shall be deemed and counted as Common; a split in the end of a board or plank nearly straight

"and not over two feet in length, shall
 "not condemn it to an inferior quality;
 "the split shall not vary more than half
 "an inch to a foot from a straight line:
 "Provided, It has no other defect; that
 "all boards or plank that are rotten,
 "worm-eaten, wind-shaken, or other-
 "wise defective, may be docked accord-
 "ing to what the Inspector, upon his
 "oath, shall deem them injured for the
 "mechanic's use. All grub plank and
 "binders shall be counted at half the
 "quantity actually contained therein,"
 etc., etc.*

These regulations are explicit; and,
 although it has become customary to

divide lumber, intended for purchase by
 consumers, into a greater number of
 grades, than above enumerated; yet it
 will be seen, that where boards or plank
 in seasoning develop shakes, &c., which
 were not visible before, a compliance
 with law necessitates a second sorting.

These hints are thrown out, in the
 belief that their observance will be found
 mutually beneficial to dealer and con-
 sumer, and as having a direct bearing
 upon those subjects, to whose discus-
 sion this Magazine is devoted.

We herewith append a Table, showing
 the number of square feet contained in a
 given piece of Lumber. It will be found
 useful, as a check to hurried calcula-
 tions, and may be relied on, as accurate:

* Purdon's Digest—Art. Lumber, par. 8, page 672.

SIZE.		LENGTH—IN FEET.											
Inches.	12	14	16	18	20	22	24	26	28	30	32	34	36
3×4	12	14	16	18	20	22	24	26	28	30	32	34	36
5	15	17 $\frac{1}{2}$	20	22 $\frac{1}{2}$	25	27 $\frac{1}{2}$	30	32 $\frac{1}{2}$	35	37 $\frac{1}{2}$	40	42 $\frac{1}{2}$	45
6	18	21	24	27	30	33	36	39	42	45	48	51	54
7	21	24 $\frac{1}{2}$	28	31 $\frac{1}{2}$	35	38 $\frac{1}{2}$	42	45 $\frac{1}{2}$	49	52 $\frac{1}{2}$	56	59 $\frac{1}{2}$	63
8	24	28	32	36	40	44	48	52	56	60	64	68	72
9	27	31 $\frac{1}{2}$	36	40 $\frac{1}{2}$	45	49 $\frac{1}{2}$	54	58 $\frac{1}{2}$	63	67 $\frac{1}{2}$	72	76 $\frac{1}{2}$	81
10	30	35	40	45	50	55	60	65	70	75	80	85	90
11	33	38 $\frac{1}{2}$	44	49 $\frac{1}{2}$	55	60 $\frac{1}{2}$	66	71 $\frac{1}{2}$	77	82 $\frac{1}{2}$	88	93 $\frac{1}{2}$	99
12	36	42	48	54	60	66	72	78	84	90	96	102	108
4×4	16	18 $\frac{2}{3}$	21 $\frac{1}{3}$	24	26	29 $\frac{1}{3}$	32	34	37 $\frac{1}{3}$	40	43 $\frac{2}{3}$	45 $\frac{1}{3}$	48
5	20	23 $\frac{1}{3}$	26	30	33 $\frac{1}{3}$	36	40	43	46	50	53 $\frac{1}{3}$	56	60
6	24	28	32	36	40	44	48	52	56	60	64	68	72
7	28	33 $\frac{1}{3}$	37 $\frac{1}{3}$	42	46	51 $\frac{1}{3}$	56	60	65 $\frac{1}{3}$	70	74 $\frac{2}{3}$	79 $\frac{1}{3}$	84
8	32	37 $\frac{2}{3}$	42	48	53 $\frac{1}{3}$	58	64	69 $\frac{1}{3}$	74	80	85 $\frac{1}{3}$	90	96
9	36	42	48	54	60	66	72	78	84	90	96	102	108
10	40	46 $\frac{2}{3}$	53 $\frac{1}{3}$	60	66	73 $\frac{1}{3}$	80	86	93 $\frac{1}{3}$	100	106 $\frac{2}{3}$	113 $\frac{1}{3}$	120
11	44	51 $\frac{1}{3}$	58	66	73	80	88	95 $\frac{2}{3}$	102	110	117 $\frac{1}{3}$	124	132
12	48	56	64	72	80	88	96	104	112	120	128	136	144
5×5	25	29 $\frac{1}{6}$	33 $\frac{1}{3}$	37 $\frac{1}{2}$	41	45	50	54 $\frac{1}{6}$	58 $\frac{1}{3}$	62 $\frac{1}{2}$	66 $\frac{2}{3}$	70 $\frac{5}{6}$	75
6	30	35	40	45	50	55	60	65	70	75	80	85	90
7	35	40 $\frac{5}{6}$	46	52 $\frac{1}{2}$	58 $\frac{1}{2}$	64 $\frac{1}{3}$	70	75 $\frac{5}{6}$	81 $\frac{2}{3}$	87 $\frac{1}{2}$	93 $\frac{1}{2}$	99 $\frac{1}{6}$	105
8	40	46 $\frac{2}{3}$	53	60	66	73	80	86	93	100	106	113	120
9	45	52 $\frac{1}{2}$	60	67 $\frac{1}{2}$	75	82	90	97 $\frac{1}{2}$	105	112 $\frac{1}{2}$	120	127 $\frac{1}{2}$	135
10	50	58 $\frac{1}{3}$	66	75	83 $\frac{1}{3}$	91	100	108 $\frac{2}{3}$	116	125	133 $\frac{1}{3}$	141	150
11	55	64 $\frac{1}{6}$	73	82 $\frac{1}{2}$	91	100	110	119	128 $\frac{1}{6}$	137 $\frac{1}{2}$	146	155	165
12	60	70	80	90	100	110	120	130	140	150	160	170	180
6×6	36	42	48	54	60	66	72	78	84	90	96	102	108
7	42	49	56	63	70	77	84	91	98	105	112	119	126
8	48	56	64	72	80	88	96	104	112	120	128	136	144
9	54	63	72	81	90	99	108	117	126	135	144	153	162
10	60	70	80	90	100	110	120	130	140	150	160	170	180
11	66	77	88	99	110	121	132	143	154	165	176	187	198
12	72	84	96	108	120	132	144	156	168	180	192	204	216

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING

No. 3.

IN a previous paper, allusion was made to the necessary propriety of the use of both styles of landscape decoration, in the improvement of various portions of the grounds attached to buildings. It may readily be conceived, that a structure, if only of slight architectural pretensions, will appear more complete, if fronted by a terrace, or level platform, than if it is merely placed, as if by accident, on a sloping surface.

Even a rustic cottage will be greatly improved in expression, when set upon a fittingly designed terrace. This need not be elaborate, in order to produce the desired effect. If merely raised a few feet above the surrounding surface, and finished by a neatly turfed bank, an air of propriety will be given to the site of the house. It suggests at once, that proper attention has been given to secure it from surface water, and that an amply sufficient space has been carefully leveled and prepared for its reception. At the same time art, by this means, is carried beyond the mere form of the building, and introduces a pleasing connection between the vertical line of the structure, the outlines of surrounding vegetation, and the undulations of the ground.

While there is always a finished appearance attending a neatly constructed terrace, it is by no means to be inferred, that we approve of huge, unseemly banks of soil, unfurnished and slovenly prepared, that are but too often seen piled up against the walls of the house; frequently so high as to be on a level with the first floor and verandahs; and fatal alike to its architectural proportions, its durability, and the health of its inhabitants.

Buildings abounding in horizontal lines—with heavy mouldings, wide cornices, and columnar supports—particu-

larly require the accompaniment of a broad, level platform, at all events, on their principal front; and if this can be extended, so as to allow space for introducing a smooth, broad walk; or, if still further enlarged to include a formal flower garden, finishing with a supporting terrace wall, surmounted by a low balustrade, suitably divided and relieved by piers, a dignified effect will invariably be produced.

Public buildings, or massive and extensive structures of any kind, admit of the most elaborate display of architectural accessories; but the terrace platform must be on a proper scale to correspond with the size or importance of the structure; and all details liberally treated, in order to produce a grand and imposing effect. Vases, statuary, and fountains, trees, and shrubs of formal and appropriate habit of growth, will here find their fitting position.

Although it is not at all probable, that such extremes as have been perpetrated, will again be repeated; yet, it may be observed, that something nearly akin to these extravagant ornamentations is represented, even in this our day, by such decorations, as vases set on the ground, without pedestals; and figures of dogs and lions laid upon raised platforms of soil and turf; but such burlesques upon taste, cannot be admitted even as humble and unambitious substitutes for the magnificent works of art, that characterized the geometrical style in its palmy days.

For the purpose of illustration, I would remark, that the Capitol at Washington presents a most remarkable instance of the want of appropriate surroundings. This splendid pile of architecture is mounted upon, and supported by, a sodded bank. This statement may appear extravagant, but it is a visible fact. Not only is it surrounded by a bank of soil,

but even that is finished in a very slovenly manner. A railway embankment is far more regular, for the material of which it is composed is seldom interfered with, and consequently it remains stationary at the angle of repose; but even the chance for beauty in that natural arrangement is not here allowed. Even a sod bank may be artistically designed, as well as artistically executed: here it is neither: the corners are rounded off, and the breadth contracted at the most salient points; the slope is very unequal in its angle, and the finish decidedly tawdry; the whole unhappily conceived and carelessly executed.

The surroundings of this massive structure suggest a feeling of insecurity, nothing, apparently, to prevent it from pressing out its foundation, or sinking into the grassy bank.

The style of architecture prevailing in the building is that, which above all others requires, and indeed demands an appropriate connection with its surroundings, by means of the decorative accessories of geometrical gardening.

We allude more particularly to the west front, and the ends of the building. The eastern or main front is apparently finished, so far as relates to ground levels and elevations; and—however unfortunate it may be, that it is considered complete—it is rather improbable that any alteration will be made in that direction. But with reference to the west front, its present unfinished and unsatisfactory condition allows encouragement for suggestions; and I fear no contradiction in asserting, that it presents the best opportunity on this continent for an example of the highest style of elaborated architectural terracing, and the exhibition of works of art, and for the following reasons:

First. As a means of properly connecting the building with the grounds, replacing the present bank of unsupported soil, by strong retaining walls of substantial masonry,

Second. It is apparent to every in-

telligent observer, that the relative proportions of the building to the dome is very deficient. The height of the latter is relatively too great. Like a classic vase set on a grass plat, without a pedestal, it lacks a fitting base; the elevation of the massive structure does not present sufficient support, artistically considered, for the dome; and to bring out the true beauty of the composition requires a greater elevation and more massive extent of base.

This can be secured by terracing the west front and ends, in three or more platforms, each platform being distinct in its ornamentation and details, with appropriate statuary, &c., placed on the piers of the balusters; the whole producing a grand scenic effect, and giving the much-needed additional elevation to the mass of the building proper.

Third. This architectural foreground, while it forms the only artistic mode of finish allowable in a structure of this style and character, will afford a much-needed opportunity of displaying such works of art as statuary, vases, urns, wall fountains in alcoves, Grecian pavillions, terrace steps, and balustrades. These last affording great latitude for refined taste, both in design and application. All of which will be in the most correct and refined harmony with the style of architecture of the building. Indeed, without these accompaniments, it must be considered imperfect and unfinished.

The refining influence of the study and contemplation of the fine arts upon communities has long been acknowledged, and is thus alluded to by Ware, in his admirably finished *Sketches of European Capitals*:

"Sculpture should help to dignify all our public buildings, and soon it will do so. As once, in Athens and throughout Greece, it will not be private wealth, so much as that of the state, that will honor itself by leaving everywhere proofs of an exalted and elegant taste, as well as of intelligence in the administration of public affairs. No piece of architecture

is complete, without its sculpture in statue, and bust, or relief, in marble, or brass; and so it will be thought. The pillar requires its capital of acanthus leaves; the building, its ornamental frieze, its statues and reliefs without, its histories and allegories within."

"The fine arts, though holding but an humble rank in the scale of merit of the mere utilitarian, hold a much higher one; and, I will add, juster one, in the scale of the man of good common sense, as well as in that of the mere lover of the beautiful. I cannot but think that the love and study of these arts must be followed by useful influences on human character generally, and especially are its elevating and refining influences needed on our American character; and for this reason, if for no other, ought to be cherished."

"Though with but little general education, the Italians are a people of great refinement of manners. As one, among both the causes and evidences of refinement, I would name their general love and appreciation of art; they love it and honor it; and it reflects an additional beauty upon their character. Their governments, also, honor and cherish it. They regard it as a means of education, and a source of innocent pleasure, contributing largely to the happiness of their people, to whom they throw open all their treasures, both of sculpture and painting."

In connection with these ornamental necessities there is another important positive beauty of the geometrical style, which should be introduced at the Capitol. The grandeur of long, straight avenues, and the splendor of their vistas, must always arrest attention. The elements that produce sublimity in a scene are *repetition* and *continuity*; and these are developed in properly planted avenues.

Let such an avenue be constructed, from the Capitol to the Potomac river, taking the National monument as a central point in the view. Let this avenue

be planted on its margins with that beautiful, unique, and appropriate tree the Tulip Poplar, *Liriodendron Tulipifera*, leaving a clear vista three hundred feet in width; and an effect would be produced of great scenic grandeur, if not of sublimity.

I have here alluded to this national structure, because it is a fitting illustration of the subject of this paper, and because the Capitol, as an architectural design, requires such massive adornments to bring out its true beauties, which will not, otherwise, ever be seen; and I may further remark, that the above suggestions are perfectly practicable. There are no existing improvements, of any value, in the way of executing any or all of them.

There is a certain sublimity of beauty in a perfectly straight and judiciously planted avenue, that is not attained by any other disposition of trees. Occasionally, in travelling through some of the older States, we get a glimpse of the remains of some fine old avenue leading to an old mansion of hospitable aspect. But these venerable remnants are fast decaying, the trees generally used were of short-lived species, and otherwise undesirable for the purpose. It has unfortunately become fashionable to decry this mode both of forming and planting avenues. They are by some pronounced as being stiff, formal, and destitute of beauty. There are those, who profess that they can see no beauty in a road, unless its lines are curving, and that with mathematical precision. But beauty does not depend upon mathematics. It can be recognized, without the ocular demonstration of engineering processes. A curved line is not beautiful simply because it curves. Other associations of the elements of beauty have to be taken into consideration. Neither is a straight line devoid of beauty, because of its form. On the contrary, it is only by uniformity of color and form, and regularity and continuity of line, that we can produce grand and imposing effects.

In the formation of grand promenades, for large assemblages of pedestrians, such as are to be found in a public park, or an approach to a public building, straight avenues of ample width, and suitably planted, are, in the greatest degree, fitting and appropriate.

Independent of their intrinsic beauty, their very evident utility stamps them with a fitness to the end in view, which is universally acknowledged and appreciated. All those who have seen the mall in the Central Park of New York, of a "music day," will have a lively recollection of the effects produced by simple straight lined avenues, and architectural gardening, where large assemblages of people congregate for pleasure and recreation.

As a connecting link between the horizontal and vertical lines of streets and city architecture, and the flowing or curving lines of vegetation and undulating ground surfaces, a straight avenue is in the best taste, and harmonize the extremes of art and nature by a most pleasing and agreeable transition.

It will appear evident that the geometrical style has its peculiar beauties; and that its adoption, to some extent, is necessary in the immediate vicinity of buildings. The proper connection of the building with the grounds, is one of the most decided, as it is one of the least attended to, of all improvements. To condemn the beauty of an artificial scene in the eyes of many persons, we have merely to remark, that it is formal. They overlook the circumstance, that formality in this case, is only an element of harmony; and is only employed so far as is required, for a harmonious arrangement of parts. It would be difficult to point to a greater perversion of taste, than that to be seen frequently in city gardens and public squares, where, parallel to the straight line of the boundary fence, may be seen a serpentine walk, making a turn every few yards; and every twist in it visible from one end to the other. There is an entire

want of harmony, between the two lines, and no compensating advantage, whatever, to give even a shadow of necessity for the departure from a straight line. In the case of public squares, more particularly, convenience will dictate the best course for the walks, as they are used for accommodation as much as for pleasure; and no one prefers on all occasions, to walk round the circumference of a circle, when a line through its diameter is equally accessible.

Roads and walks, moreover, are not particularly indicative of any style. They are objects of strict utility, and should only be introduced where and when necessary; although it is too often the case, that they are run through pleasure grounds, because they looked well on paper, cutting the plan into parts for the purpose of filling up the space with lines. This is not landscape gardening, notwithstanding it is frequently considered as such. Any school-boy, expert with rule and compasses, could furnish such designs *ad libitum*.

The principles of beauty are the same, whether applied to gardening or architecture. In the application of these principles to the development of beauty, the latter has many advantages over the former. The architect operates with inanimate nature; and, as a consequence, his productions are most perfect the moment they are completed. It is his aim to bring his work as near to perfection as possible, and make it as permanent, as stability of position, durability of materials, and strength of construction will allow. All natural changes after completion are steps in the progress of decay. The materials in the hands of the gardener are of such a kind, that many years are required for its progress towards maturity. His plans must therefore provide for this gradual growth, as well as admit of the many alterations consequent upon the time, that must elapse, between their formation and ultimate development.

W. S.

WASHINGTON, D. C.

SUGGESTIONS IN BUILDING DWELLING-HOUSES.

IN planning a dwelling for family occupancy, three prominent characteristics are to be kept in view :

1st. The size and arrangement of the house must be adapted to the comfort, and to the means of the family.

2d. The climate is to be considered.

3d. In connection with climate, the material to be used in the construction.

Keeping these in view, I shall make a few suggestions, for the consideration of families of moderate fortunes, who may be planning country residences.

1st. That, but two apartments, besides the hall, the kitchen, and the offices, are required.

These two, a dining-room and a parlor, should be large, and adjoining, so as to communicate. This, for convenience and economy of fuel, in winter.

Having determined on the size and proportions of these rooms, and the chambers over them, the next consideration will be the kitchen and domestic offices.

These should each be planned separately, and then placed together, in such contiguity, as will best adapt them to the family requirements. The error, mostly committed, by those planning dwellings of moderate size, is, in first laying down the outline or outside of the house, and afterwards dividing it into apartments; the consequence of which is, that the rooms are likely to be reduced in size to make place for the pantries, closets and other offices.

An ingenious architect will, after having determined on the number, size, and proportion of the apartments, arrange them with proper regard, both to the convenience and the architectural beauty of the house. Domestic comfort should not be sacrificed for outside show.

We have here in this country to encounter a climate, which differs from that of most other countries. The ther-

момeter ranges over more than 150° Fahrenheit, from summer to winter. That is, we have in winter, to contend against a temperature of more than ten degrees below 0° F., and in summer, of 140° F., in the sun.

The architect has to protect the occupants of his dwellings against the dangers and discomforts arising from these extremes; to exclude heat in summer and cold in winter. Whilst his walls, and doors, and windows, must exclude the rigors of an almost Arctic winter, they must equally provide against the pernicious dampness of our spring weather, and the sultriness of our summers.

Double windows and double doors—with every conceivable pattern of weather-strip—are used, to close out the penetrating blasts of winter, then to be removed on the return of summer, to admit the breeze. The double windows, and double doors generally used, are unsightly and inconvenient. In place of them, I would suggest oriel and bay-windows. These, when properly constructed, so as to present three (3) open sides, each provided with sash and shutters, which may be opened and closed at will, afford protection from the summer sun, and, when opened, entrance to the breeze in our sultry season; in the winter time, when provided with shutters and glass, so arranged, as to shut them off from the apartments, they are a much more effectual protection against the entrance of cold than any other window.

Casement sash when they can be used, and when properly constructed, are the cheapest, and the most conducive to comfort, of all others. At the same time, while admitting free ventilation in summer, they exclude wind, rain and snow in winter.

Lastly: As regards the material to be used, in the construction of the build-

ing, I recommend a wall of common cheap brick to be prepared for weather-boards, (not frame,) with which the building is to be encased.

A house thus built, the weather-boards being nailed on *horizontally*, will be found to be the cheapest, the most comfortable, and the most enduring of all others in this climate. Let any one observe a house built of brick or stone, either painted or plastered; and it will be seen, that after a drifting rain, the walls become saturated with moisture. And should the winter immediately succeed, this moisture will freeze into ice; and the residents are, for the season, encased in ice and dampness.

Lathing a house, on the inside, will certainly exclude some of this moisture; but nothing except weather-boarding, will protect the *walls* from the ruinous effects of moisture and ice. By weather-boarding a brick or stone house, we effectually exclude cold, and heat, and wind, and moisture.

As to the durability of wood, there can be no question, when it is painted, and when the boards are placed *horizontally*, and *well lapped*.

In New England, New York, and the Southern States, wooden houses may be seen still, in good repair, which are more than a century old.

Every architect has seen the studding and joists and jamb-casing, on the eastern sides of *stone houses*, greatly decayed, after but a few years of occupancy, the result due to the dampness of the stone.

A brick house weather-boarded, will not require lathing on the inside of the walls. I have seen the ceiling of a room reeking with moisture, in damp weather,

whilst the walls, which were plastered on brick, were dry.

Before closing, I will draw attention to a frequent cause of dampness or sweating of walls, namely, that sand is in some instances used, in the last coat of plaster, which has been procured from the salt-water beaches of the lower Delaware. Sand, from thence, contains salt, which, in dry weather, may be dry, but in damp, sweaty weather, the salt deliquescing, will forever cause damp ceilings. After a time, not only will the plaster so composed become rotten, but also whatever wood-work is in contact with it. Hence, care should be taken to procure the sand from the upper Delaware.

In a house of moderate size, the ceilings should not be higher than ten feet.

High ceilings in winter are not easily warmed; and, besides this objection, high ceilings entail difficult stairs. Where the ceilings are to be ornamented, every foot above ten feet in height will require a very large addition to the length of the room. For example, take into consideration a room, the ceiling of which is to be adorned with paintings, would it not be absurd, to have those ceilings of so great a height, in proportion to the length of the room, that the ornaments of the ceiling could only be seen by a painful elevation of the head? *Just taste* requires, that the fresco or ornamental painting on a ceiling, may be seen *without an effort*; and this can only be done, when on high ceilings, in very large rooms. In walking through a suite of rooms, of pleasing proportions, the paintings on the ceilings as on the walls are enjoyed if viewed without fatigue.

E. C. E.

MAPS are generally supposed to be the embodiment of the results of careful surveys; but, even in those countries longest civilized, much they contain is made up from the routes of travel, by course and distance. The various gov-

ernmental surveys for different purposes, the explorations of mining regions, the prospecting and actual engineering of railroads, &c., provide fuller materials every year; but it will be long before we really know the surface of the earth.

W A T E R .

THIS fluid is one of the few positive necessities of man; and without it the wretchedness of his condition would be quite as great as in the absence of air or heat. In cases of shipwreck, the want of water is the most fearful of all the torments which suffering man has to bear. Such is the imperative demand of thirst, that, in the absence of fresh water, the unfortunate is driven to the drinking of salt water, and this, producing frenzy, terminates his existence in horrible spasms. On the parched, sandy desert, when the supply of water has given out, how the traveller yearns for that oasis, in the midst of which he will find the cooling spring to quench his burning thirst. What greater horror awaits the damned than the want of even one single drop of that element upon which man, in the midst of his abundance here, so seldom spares a thought!

The luxury of pure drinking-water is one that he alone can realize who has been compelled to use the turbid water of the Missouri, the Ohio, or the Mississippi. Those who have lived in St. Louis can thoroughly relish the clear and limpid beverage of the more favored localities, and bear testimony to the merits of the heaven-born draught, in its purity.

It would be only reasonable to expect that, in our day of scientific advancement, the subject of pure drinking-water would be one to draw forth all the attainable advantages, which a thorough knowledge of the subject gives. But such is not the case. The fact is, the ancients were far in advance of us, if not in the knowledge of theoretic philosophy, certainly in the practical processes proving its truth. They knew that purity is the natural state of water, and that every thing, which tends to turn it from its primitive condition, is unnatural or foreign to it. Turbid rivers are so, because of the extraneous matter

they have acquired, and hold in solution, whether mineral, or vegetable.

The presence of mineral matter renders the water *hard*, and unfit for cooking, or washing. And the presence of too much organic matter renders the water utterly useless for drinking purposes, and very unwholesome, even for cooking with.

It is said, that marsh-water itself may be made drinkable, by steeping in it certain herbs, or, by rubbing the kettles, it is boiled in, with bitter seeds, or herbs. In China and Japan they use, for this purpose, the tea plant; in India the *strychnos potatorum*; and the bitter almond on the banks of the Nile.

There are other difficulties, which the best of water is liable to; and those arise, sometimes unaccountably, under apparently, the most stringent system of precaution.

Some years since, the citizens of Boston were suddenly disgusted with their favorite Cochituate water on account of the villanously fishy taste and smell acquired by the decomposition of vast numbers of animalculæ, setting free an oil, which imparted the unpleasant qualities.

The city of Amsterdam was in 1856 subjected to the same annoyance with the addition of a reddish deposit. A commission of scientific men, appointed to examine into the matter, discovered, that it arose from the decomposition of masses of *Algæ-conferræ*, and other water plants.

It is ascertained, that letting such water remain, for some hours, in contact with large surfaces of iron, renders such, and other, impurities insoluble, or it will altogether destroy them. But perfect filtration must be resorted to, afterwards, before such water is fit for use.

Now, this brings us to the considera-

tion of the actual necessity for *iron cisterns* and *pipes* in the reception and transmission of water, for domestic purposes, in our cities; and also to the depreciation of *lead* as a medium.

If *Iron* possesses sanitary advantages, *Lead*, on the other hand, is pernicious in its very nature, as it gives out *salts of lead*, slow but deadly poisons.

Hence the lining of cisterns with lead, with the use of that material in pipes, is dangerous, and should be abandoned at once, in all cities, where the health of the community is a matter of consideration.

To obviate this objection to the use of lead, a recent invention, or rather improvement, has been patented for tinning pipes on the inside.

Water is so susceptible of change, from mineral action, that the location of certain manufactures, near certain rivers, often gives permanent merit to an otherwise ordinary business. Thus, the presence of calcareous salts, in considerable quantities, in the river Trent, in England, renders Burton-on-Trent celebrated for its ale.

There is a great difference in the water of rivers, when used on sea-voyages.* Some will remain drinkable for weeks. Others again will not hold good for one week. Some will turn foul in a few days; and at the conclusion of two weeks will regain their original taste very nearly. But all water, from whatever source derived, should be carefully placed, either in iron tanks, or in casks, the insides of which have previously been carefully charred.

It may be considered foreign from our province, to allude to matters connected with the economy of sea-voyages; but, viewing this subject in a philanthropic light, we think we do not deviate from our chart; besides treating of water under various circumstances.

Some forty or fifty years ago, even in Europe, the supply of cities was indifferent, to say the least; and a positive disgrace to the age, as compared with the admirable proofs of the paternal solicitude of ancient governments, for the health of the people, which yet remain to us in those vast structures, the *aqueducts*, which supplied Rome, Lisbon, and other cities, with pure water, conveyed, over all impediments, for surprising distances. The Romans, in this alone, have rendered their national character immortal; as all the works of our day, such as the Croton Aqueduct, the Chicago Tunnel, &c., fall into insignificance, as compared with those of that mighty nation.

The introduction of water-works into our cities generally, is of more recent date, than that of gas-works. But, many of our cities may vie, in this respect, with any thing that modern Europe can produce. Such, for instance, are New York, Brooklyn, Boston, Baltimore, Cincinnati, Detroit, Chicago, Buffalo, and last, but far from least, in utility, and pre-eminent in beauty, our own Fairmount Water-Works.

These various institutions are creditable to the respective cities; for the benefit of which they were constructed. But it strikes us, that they are, each and every one of them, defective in the one thing, of all others, most needed, namely: **FILTRATION**. Water, to be pure, for drinking purposes, should pass through an ample bed of gravel and sand, with a layer of charcoal, between the two; and should be so managed, as to force the water, from the receiving-basin, through this bed, or wall—either flat or horizontal—with sufficient force and adequate volume for the known consumption.

This Section of Filtration should be kept in good order, by constant, watchful care and cleansing. No excuse, for the neglect of this, should be tolerated by the superintendent of water-works; and those subordinates, having to per-

* The water of the Schuylkill, just above its confluence with the Delaware, or a little below Philadelphia, is by mariners considered to be of the very best quality for long voyages.—Eds.

form this duty, should be closely watched and held strictly accountable, in view of the health of an immense community, which they actually watch over, and which is dependent on them. For, THE PURER THE WATER THE SURER THE HEALTH, may be taken as the maxim, which should invariably govern the management of water-works.

We will now turn our attention to those of our citizens, outside the influence of water-works, either residents of the suburbs, or dwellers in the country.

In case there should be a difficulty, in obtaining water fit for drinking purposes, by the sinking of wells, as frequently is the case, it would be well to have a capacious cistern, with a filtering compartment, which would receive all the rain-water from the roof, provided that the roof is not of lead, and has not soldered joints.

Such a cistern should be constructed on principles of strength, durability, and sanitary precaution. Strength does not, in the making of cisterns, necessarily involve durability, the latter being dependent on the material of which the cistern is constructed; and that material must be such, as to give resistance to the decay, which is the consequence of *exhalation* and *corrosion*.

In case the cistern is covered in with boards on joists, exhalation is sure to work slow, but certain ruin; and this fact can scarcely be too well noted, where it is proposed, as is often the case, to put a cistern in the cellar-basement, for the convenience of having a small pump in the kitchen or laundry, above it. In such case, also, it should be borne in mind, that water, covered in, will turn foul quickly, from the fact of its mephitic gases, having no means of escape, settling down on and impregnating the surface, thus generating animalculæ, whose decomposition is so destructive to the purity of water. Such a condition of things is abundantly productive of that troublesome little atten-

uity, the sanguinary mosquito; and, supposing such cellar cisterns to be left uncovered, the same consequences arise; and the floor above it becomes constantly damp, and speedily rotten. Added to which, the damp air penetrates the upper part of the house; and superinduces those fatal pulmonary and bronchial affections, which are the more deplorable, as arising from a source, so thoughtlessly created.

Lime should not take a prominent part in forming the lining of cisterns, as its effect is, to harden the water; and unfit it for domestic purposes. Cement, or, as it is often called, water-lime, on account of its property of setting under water, is found to be an excellent lining for cisterns. But the *first filling of water* should be pumped out, and the cistern, when thoroughly hard, carefully cleansed.

Brick makes a good lining for some years; but its porousness is apt to admit external influences; and absorb and retain, internally, those objectionable substances held in solution; and, consequently, offers an impediment to cleansing the cistern.

Zinc lining, for large cisterns, is good; but, like that best of linings—iron—is too expensive, for general use.

Wood is not to be recommended; as, apart from its decaying propensity, in large surfaces, it gives a peculiar, and not agreeable flavor to water, quiet so long as cistern water is liable to stand, not to speak of the vermiciparous propensities of such material, when so used; unless, indeed, the interior be well charred.

The Chinese and Japanese use porcelain tiles, in forming cisterns. This, we consider an excellent practice; and one, which might be followed here, in the form of encaustic tiles, or glazed earthenware.

We see no objection, for this purpose, to the use of *glass* cast in large, thick plates, such as those used so generally, now-a-days, over areas and for sky-

lights in floors. At least this thick glass might be used, to advantage, as a covering for cisterns, in a hinged frame, to be left open, as often as safety would permit.

Silicate of Potassa would make an excellent coating for a brick cistern, and present all the advantages of glass, without the necessary joints.

But the majority of these materials proposed for the formation of cisterns, are expensive; and, as our aim, end, and object is, to benefit the community at large, we would recommend the formation of cement cisterns, of the simplest forms; as, for instance:

Dig a circular hole, in the chosen site, and rough-wall it with stone, or brick, finishing by coating the surface and bottom with pure cement, on a thick coat of cement and sand, in equal proportions. This will make a good ordinary cistern whence to draw water.

When an elevated piece of ground can be had, within any reasonable distance from a building, which it is required to supply with water, possessing an altitude equal to that of the eaves of the roof, we would recommend that the cistern should be placed on such rising ground; so that the surface of the water when the cistern is full, should be exactly on a level with the eaves, or a little below, if possible; and, as the supply becomes exhausted, the surface of the water will be lower and lower beneath that level, only varying the depth of the cistern. It is needless to say, that it should never be so located, that the level of the water in the cistern would be higher than the eaves, whence the supply is derived, as any one acquainted with hydraulics, knows that this would be going against all the acknowledged rules of that science. The rain-water from the roof will be collected from the different gutters, and concentrated into one main iron pipe, extending up to the eaves, having the joints calked, to enable it to withstand the pressure of the head, thus obtained.

This pipe will be brought down from the eaves and run into the ground a depth sufficient to protect it from frost; and then continued underground until fairly connected with the *bottom* of the reservoir. By having the top of the latter, on a level with the eaves of the building, this supply-pipe will also answer for the purpose of distributing; and connections can be made for that purpose, wherever it is desirable. This iron supply-pipe, from the eaves downwards, should, in all instances, wherever the climate is cold enough to freeze, be placed in a flue, made to receive it, so arranged as to admit of a circulation of warm air, during cold weather.

When cisterns of large dimensions are required, the best mode of constructing them, is to dig a horizontal trench, from six to eight or ten feet in width, and of any required length; and, within this, form a circular tube or horizontal cistern, of almost any diameter, or length, that may be wished. When they are of large diameter, the shell should be built of hard-burned brick, straight and of uniform size, in order to make close joints; and should be from one foot to one foot four inches thick, laid in concentric separate rims or courses, one above the other, in cement, mixed with one-half sand, except the inner rim, which must be laid in pure English Portland cement, with a coating of the same on the inner surface. The exterior should be well packed with earth; and, in all cases, the top surface should be at least three feet six inches below the surface of the ground. When cisterns are constructed in this manner, they can be extended, so as to contain larger quantities of water, retaining, at all times, an uniform depth, not varying more than its diameter. Such are also easy of access, for the purpose of being cleansed. Whenever this is desirable, in choosing a site for such cisterns, regard should always be paid to drainage. A waste-pipe should be connected with the lowest point of the supply-pipe,

that all the water may be discharged from the supply-pipe, as well as from the cistern. An overflow, or air-pipe, is in all cases absolutely necessary. This should be, at least, six inches in diameter. An entrance must not be overlooked; and, where the cistern is of any considerable length, two would be preferable. These are made circular, about two feet six inches in diameter, with case and covers, which should be of iron.

We have frequently constructed cisterns, upon the above principles—that is, of a tunnel, or culvert, closed at both ends—of from 100 to 200 feet in length and eight feet in diameter, in localities, where the entire supply depended, altogether, on rain-water. They were, in every instance, found to answer in all respects; and to be amply sufficient to meet the requirements of stock, as well as domestic purposes, on large plantations.

The water kept within reservoirs of this description is found to bear the same temperature, never varying throughout the different seasons of the year.

Finally, we must again refer to, and insist upon, the necessity of caution in the conveyance and preservation of water, with a view to its perfect purity.

The Romans paid so much attention to this subject, that a civil officer, entitled the *Aquator*, was commissioned to preside over the supply of water for the city, one of whose duties was, to test its purity constantly, and, on detecting the slightest change in color, taste, or smell, to report to the government, whereupon, an investigation being had, the necessary steps were immediately taken; and the health of the citizens insured, by this sanitary guardianship.

STAINED GLASS

IN

MEMORIAL WINDOWS.

THE following extracts are taken at random from the July and August numbers of the London "Builder" for this year, out of a column regularly devoted to the exclusive purpose of chronicling any such presentations of memorial windows, and briefly describing them. We have selected these with the design of exhibiting to our readers what is being done every day in England, throughout every parish and every village, in the way of beautifying and embellishing their churches and chapels; and, at the same time, erecting memorials of love and affection to departed relatives, friends, or benefactors. We are aware that this praiseworthy and prevalent custom there is beginning to be developed amongst ourselves; but it is with the earnest hope of stimulating

its growth, and urging it on to a still more extended development, throughout our land, that we have brought the subject before our readers.

Surely there can be no more beautiful or chaste token of the remembrance of the friends whom we have lost, than a memorial, stained-glass window in the church in which we have so often worshipped in company with them, appealing, as it does, at once to our feelings, sensibilities, and our innate love for the beautiful.

We feel sanguine that it needs only greater publicity to become customary throughout the country, our people being always eager and enthusiastic in the embellishment of their place of worship; and likely to be still more so, when, in carrying out this object, they

are, at the same time, raising memorials of love and respect for the dear ones whose loss they deplore.

It may be thought, perhaps, by some who have an eye to the practical as well as to the beautiful, that glass is but a frail and perishable material, whereof to erect monuments, or memorials, compared to marble or granite. To such we can only reply, by referring them to the truly beautiful and wonderfully perfect specimens of this art of Glass Painting, which are to be found not only in England, but especially on the European Continent, four and five centuries old, still retaining all the gorgeous, and, at the same moment, sublime and artistic coloring, and richness of effect, for which, men like Albert Durer, were so deservedly famous. These glorious productions of the art are still regarded as master-pieces, not only in the "costly crystal and gorgeous oxides of the glass painter," but as evincing a time, a care, and a laborious skill, worthy at once of the noble material and the lofty and beautiful subjects delineated thereon.

STAINED GLASS.

St. Michael's, Worcester. The chancel window of St. Michael's Church, Worcester, has been filled with stained glass by Messrs. Done & Davies, of Shrewsbury. The subject, which occupies the three openings of the window, is the Crucifixion. In the upper part of the centre opening, is our Saviour on the Cross, looking towards the penitent thief, who is in the side opening on His right hand; the impenitent thief being in the side opening on His left. At the foot of the Cross are Mary Magdalene and His mother. The design was chosen and executed under the direction of Mr. H. Bennett, who presented the window to the church.

St. John's, Cowley. A stained-glass memorial window, of three lights, has just been placed in this church. The subjects are the Marriage at Cana, the

Man at the Pool of Bethesda, Raising the Widow's Son, Christ Blessing Little Children, and, in the centre, our Lord Raising Lazarus. The detail of the window is grisaille, the subject in the centre being surmounted by a canopy. It was designed and executed by Mr. Baguely, of Newcastle-on-Tyne. The east window of the same church is in hand, by the same artist, for the Rev. R. W. Benson, of Cowley; and will shortly be erected.

Abbey Church, Cambridge. One of the windows of this church has been filled with stained glass, in memory of the late Mrs. Preston, wife of Mr. T. Preston, of the Abbey. The centre opening is filled with the Crucifixion; and our Saviour is surrounded with an aureole and glory, on a blue and ruby ground work, the latter representing heaven, and the former, earth. In the trefoil, above, is an angel holding the emblem of the Trinity; at the base is a lamb, an emblem of our Saviour, with ornamental work. The left hand opening contains the Nativity, the right, the Baptism. The whole are under Early canopies. At the base of the outer subjects is the Alpha and the Omega, surrounded with ornamental groundwork. In the trefoil, above, there are angels holding scrolls. The artist engaged was Mr. Constable, of Warwick.

Kimbolton Church. A stained-glass window, from Messrs. Avery & Sons, London, representing the Resurrection of our Lord, and the Appearance of the Angel to the Marys at the Tomb, has been placed in one of the windows on the south side of the church. This window is erected to the memory of the Rev. T. Ainsworth, the late vicar.

St. James, Carlisle. The decoration of the chancel of this church has now been completed, the small windows, on each side of the apse, having been filled with stained glass, corresponding in form and coloring with the window at the east end, which was put in previous to the opening of the church.

Each window is composed of one large panel; and contains in the centre a pictorial representation of an incident in sacred history, surrounded by a rose border on an azure and ruby ground. The subject of the left window is the Raising of Jairus' Daughter. The window on the right side of the apse contains a delineation of the youthful Saviour disputing with the Doctors in the Temple. The west window is large, and if it were also filled with stained glass, the strong light which streams through it would be softened; and a more pleasing effect produced. Two of the three stained-glass windows in the chancel have been presented to the church by Mr. Nelson, of Murrell-Hill House, and the third by Mrs. Nelson.

Whitchurch Church. Messrs. Ward & Hughes, of Soho Square, have recently completed in this old church a window, which has been erected by their surviving children to the memory of the late Mr. and Mrs. Churton. The architecture of the edifice is of the Roman type; and a semi-circular headed window, measuring 22 feet 6 inches by 8 feet, on the south side has been filled with painted glass of the 16th century character, treated with large-sized figures, the costumes of which are executed with a view of representing the Biblical period. There are two subjects: that above the gallery is the "Meeting of Jacob and Joseph in Egypt;" that below, is the "Death-bed of Jacob." The ornamental portion is characteristic, and a jeweled border surrounds the whole.

SCIENCE OF BUILDING.

THE successful building of a large number of houses in a city, during one season, is a science in itself, so broad and comprehensive, as to be almost infinite. From the moment of the projector's conception of his grand idea, the most tedious and harassing labor commences. In fact, he is compelled to build his houses before he breaks the ground. He must first organize a combination of artisans, each one dependent upon the other, yet all together forming an harmonious whole; each separate branch diverging from the main centre, yet held together by the attraction of common interest, superinduced by the absolute dependence of each upon the labor of the other, for the successful working out of the different kinds and parts; the many ramifications of which extend throughout a building, until completely finished.

A builder, to be successful, must possess force, power of combination, decision of character and strength of mind, to

command in an eminent degree; for all the elements he brings together, to form a beautiful structure, are antagonistic in their natures, requiring supreme control to harmonize the jarring discord of different interests; force, to drive them on; decision of character, to determine any question upon the moment, for nothing brooks delay; and power of combination, to bring as it were, out of a chaos of men and material, regular and irregular forms, which, when combined, present architectural beauty.

The builder of the present day has no time to be a mechanic, in the common acceptance of the term. He must be a scientific man. One whose mind comprehends all forms of mechanism; whose well-trained eye detects imperfections in any branch. He must have a mind always on the alert to improve. To create an image from an ideal is the intelligent builder's *forte*, as well as that of a regular architect. As, with sorrow and sadness, we have watched aërial castles,

often built with such tender solicitude, until they seemed real, vanish away, leaving nothing but ashes in our grasp ; so, with joy and ambitious aspirations, the builder sees his real drawn from the unreal ; his dream made tangible ; his vision of years at last realized ; in the substantial erecting, with material of form and substance, a castle not evanescent, but almost enduring as time ; a monument of his skill and energy ; his creative power transmitted to wood and stone, speaks greater volumes in the history of man, than all that poets sing, or painters paint.

The age we live in is progressive. Instead of a builder erecting one or two houses in a season, it is now not so very unusual for one man to project, erect and finish a hundred houses in a single season. To do this, requires a large outlay of capital, and a thorough knowledge and experience of the science.

The speculation of profit ; the hazard of the resolve ; the thousand contingencies of success and failure ; the prejudice of the unskilled, and the terrible ordeal of condemnation by the ignorant ; are all unknown issues, at once accepted by the builder ; and as he drives his operation through, guiding it with a skilful hand, and wary eye fixed, like the mariner's, upon the polar star ; he must make no mistakes ; no false reckoning ; but, calmly taking daily observations, satisfy himself where he stands, hold his helm steady, and, instead of drifting to shore with rudder unshipped, sail into port, under full canvas, spread victoriously ; defying calumny ; and covering his detractors with shame.

The more rapidly a builder runs his houses up and finishes them, the more he is slandered ; his business injured, and buildings condemned as being insubstantial. It would be thought hard, if any one were to say of a grocer, that maggots infest his cheese and skippers his hams ; or of a merchant, that his goods are inferior or worthless. But, how often it is said, " Why, that man's

houses are only run up ; they will fall down, being only stuck together ; you had better not purchase." The censor thereby ruining a man's valuable property, and causing it to remain on his hands at a great loss ; for no builder can afford to keep all the houses he builds. Many a man after struggling hard to get his houses through successfully and put them in the market, has been met with just such an unexpected and undeserved issue ; and, after vainly combating with a false public opinion, has, at last, succumbed and sold out, for much less than cost ; only to see the buyers realize a handsome profit in a few months, while he has entailed upon himself debts, that it may take him years to liquidate. The slightest whisper may damn a building, but it takes a long argument to convince a buyer of its merits.

It behooves a builder, to guard as much as possible, against such contingencies ; and the only way to do it successfully, is to make the operation public ; and, instead of waiting to sell houses, after they are finished, dispose of them, as rapidly as possible, during their progress of erection. Sell them, according to plan and specification ; and you then make every buyer a builder, and concentrate so many different interests around the operation, that the position is strengthened with the houses left for sale, when you are through ; and in every purchaser you have a defender and eulogist.

A successful builder must possess mercantile qualifications, to enable him to dispose of his heavy stock of goods. He must be a good and reliable salesman. While it is comparatively easy to build the houses, with means and credit, the whole pith of the enterprise depends upon the sales, for, with their proceeds, you make up your deficiencies ; pay your debts ; strike your balance ; and carry it to the profit or loss side of your account. It is only then, you can determine the result of your labors ; and after the smoke of the battle-field

has cleared away, plainly discern your position.

Equanimity of temper is a most essential characteristic, for no business is so beset by vexations, trials and difficulties, as that of building houses—there are so many mechanics, and dealers in materials of every kind, each urging his own individual interests, perhaps to the detriment of all; some, by their dilatoriness and delay, causing the whole enterprise to lag; for, as said before, each branch is dependent upon the others. Others find, when too late, that their contract is not as favorable as it might be; and are trying to get out; and some are trying to overreach. All clamoring, with perhaps much suspicion of the builders' solvency, make the concern a perfect Babel of confusion, to the inexperienced; and indeed, it is enough to drive a saint frantic.

Now for one man to control all these discordant elements; to still the troubled waters; and, amidst all the violence and turbulence of other men's passions, to be himself, as calm as a summer's morn, is as necessary to his success, as it is to his health; for it is only with perfect equanimity of temper, he can view his position fairly; and, while commanding respect, compel and enforce acquiescence in his plans and determination.

A man possessing all these qualifications may become a successful builder; yet, if he lack steadiness, abstinence from spirituous liquors they are all worthless; and he will utterly fail in accomplishing any thing. How many a brilliant genius has shot across our gaze like a meteor, and disappeared forever; sunk irrevocably, beyond all redemption, from the effects of drink! It is a vice, that in its vortex engulfs all the nobler qualities of man. No matter what may be his abilities, his intentions, or his generous virtues, they all succumb to this fell destroyer; and the poor wretch that panders to his appetite for drink, after a brief space (fluttering like the moth around the lighted candle) is shriveled body and soul; and hangs, panting on the brink of life, only waiting for God to give him rest.

Men, beware! It is the rock upon which many a noble man has split. Steer clear of it. Touch it not. You are surrounded by temptations, greater, perhaps, than any other class of business men; but I beseech you shun the intoxicating bowl. Through the columns of this book, devoted to the interests of builders, may my feeble voice be heard; and if the headlong career of only one man be checked, great is my reward!

BUILDER.

FOUNDATIONS.

MITCHELL'S SCREW-PILE, &c.

BY CHARLES P. DWYER, ARCHITECT.

THE form of MITCHELL'S SCREW-PILE is that of a two-bladed propeller. The end of the shaft is pointed and steel-topped. The shaft is solid, and connected with hollow continuations, by screwing. These continuations, or hollow shafts, are screwed on, as long as there is a demand for them. The boring is effected by means of a capstan, with

any necessary number of arms or bars, to be worked by a gang of men sufficing for the difficulty of the location.

It is necessary only to go down, say ten feet; for, the hold, which the blade, or thread, of the screw-pile takes on the material, through which it is driven, is sufficient to secure the pile thoroughly. To increase the assurance of this hold,

it would be well to have the screw-thread two feet six inches, or, even three feet in diameter.

When all the principal corners of the foundations have been thus piled, intermediate piles should be placed, at every five feet from each other, all around. Another, or inner row should now be placed three feet from the row just described, opposite to each other; and white-oak timbers, 8 x 12 inches, set into flanged chambers, cast to receive them, and these latter screwed securely down on the heads of the piles. The oak bridging will thus bind the piles longitudinally and vertically. The trenches may now be filled up with concrete, until flush with the upper surface of the bridgings. The bedding-stones may now be laid down, as before described.

The foregoing system of screw-piling might be economized, by using but a single row of piles, placing them in the centre of the foundation, and having bracketed arms across them, to sustain the longitudinal timbers, or bridgings. The former, however, is the more advisable for heavy buildings.

The trouble of managing these screw-piles is not so great, as might first seem to the builder. The use of a square truck, or hand-car, running on a temporary track, with a capstan in the centre, would make the work as easy, at least, as that of ordinary pile-driving.

In the construction of foundations, in doubtful localities, or where the substrata is varied; being, in one part sound and compact, and, in another, sandy or soft, Screw-Piling certainly would be most desirable, not having to descend so low as the ordinary pile, under such circumstances, and not requiring more than half the number of piles, in any case.

INVERTED ARCHING.

There are other methods of securing a good foundation, one of the best of which was introduced by the Romans; and was much practised up to the dis-

covery, or invention of concrete, scarcely forty years ago. We allude to the system of INVERTED ARCHING. This was, no doubt, a secure way of building, as the experience of hundreds of years so clearly proves. But the piers, in many cases, had to be constructed on piles; and the inverted arches themselves to be protected by counter-arches, which sustained the superstructure, thus forming a circle, or an ellipse, either open, or filled up, at the discretion of the architect. This mode of construction was much used in stone-bridge building; and gave great resistance to the settling down of the superstructure.

The Thames Tunnel is formed on the same principle, only the arches are necessarily transverse, instead of longitudinal; and Nature, herself, presents us with the lesson in the sectional form of the egg.

CONCRETE.

The introduction of CONCRETE, as a material for foundations, was decidedly a great triumph of scientific skill; and, it is remarkably strange, how little, comparatively, the American builder knows, about that admirable material. Our architects do not pay it that attention it merits, and has so amply received from English and French architects. It is true, our military engineers, the late General Totten among them, have experimented much in it; and developed its powers of cohesion and resistance. But the economy of its composition, in conjunction with those powers, ought to be the subject of the architect's study. This idea of taking the precaution of *piling* when using it, displays a timidity, arising from sheer ignorance of its very nature; as, if piling has to be resorted to, there is no use whatever for concrete; and, if concrete is to be depended on, there is no necessity for piling.

Mix concrete, in its proper proportions of materials; give it suitable width, *with a batter*, or slope, at the edges; and then make it not less than eighteen

inches thick; allowing it a fall of at least eighteen or twenty feet, into the trenches; and there need be little apprehension of a subsidence.

There is no necessity, whatever, for *planking* such a foundation. Lay on large bedding-stones crosswise—as already described—bedding them well on the concrete, and flushing their joints with cement. Now proceed in the usual manner; and you have a foundation, at once economical and everlastingly secure. Nature reads us another lesson in this; for, she forms her hardest and most enduring rocks of *concrete*.

In another paper we will discuss the merits of this material; and the best manner of composing it; our business, in the present, being with

FOUNDATIONS,

as we find them, in course of construction; or, as in the past.

Some architects commence laying brick immediately over the bedding-course. This we do not consider a good practice, for, if by any chance a bedding-stone should settle, in the slightest degree, the thickly jointed brick courses over it, all the way up, would catch the infection; and a palpable fracture must be the necessary consequence. No—these bedding-stones should be securely bridged by large stones, laid the reverse of their beds, and the joints cautiously broken. And such course should be covered, or guarded, by still another course, equally well constructed, with a view to unity and strength. Then the brick-work may be laid for five courses; and have a five-inch course of blue-stone, or granite, covering the whole thickness of the wall. It would not be amiss to dowel these stones together with two sets of dowels, parallel to each other, thus forming, at every five courses of brick-work, a thorough bond, that would give unusual strength, and resistance to settlement. All this, too, below the level of the cellar floor.

In fact, the main point to be observed

in the construction of foundations, is the employment only of indestructible materials, in such a manner, as to produce as complete a combination of strength as possible.

The Roman architects had recourse to still another mode of construction, which was by means of *RETICULATED BRICK-WORK*. In this kind of work, the individual bricks of each course are laid apart, nearly their own width, thus having apertures, or interstices, between all the bricks of the structure, arranged checker-board fashion, the bricks representing the white squares and the holes the black ones. This method is often used in the ventilating windows of brick stables. The brick used in such cases was vitrified, and in very perfectly moulded cubes; every fourth course being flushed and leveled, with half cubes, cast for that purpose, over which four horizontal courses of a longer brick were laid; and, then, four reticulated courses; and, again, four horizontal courses; thus continuing up, until the surface of the ground was reached.

Provided the stratum is a stiff clay, at least, on which such a foundation rests, it must be obvious, that settling is to be expected, as every thing depends on the first course; and should there be a soft spot in the upbearing stratum, however small that spot, it will be sufficient to derange the whole.

Reticulated work may be seen, in superstructures, in many parts of Europe, at this day. But, for foundations, the adventurous Romans themselves had little faith in reticulated work.

Civil and military engineers employ other modes of constructing foundations, where works are very extensive, and the location swampy, or sandy, as in the case of piers, sea-walls, railroads, &c. Both ancient and modern practice includes: *BUILDING ON FASCINES*, or, *bundles of wood*, laid crosswise of each other, and filling in, over them, with loose stones and gravel; *Building with Loose Stones* confined in *Cribs*, made of

stout wattles, and let down into soft places, such as sandbanks, moors, bogs, or the like; Building *Solid Stone Masonry* in CAISSONS, or boxes. This mode is constantly used at this day; and is decidedly useful for irregular bottoms, under water. As soon as the caisson is lowered to its intended berth, the sides and bottom, by a previous arrangement, are removed, and drawn up, leaving the solid masonry in its required position.

But, these and various other methods, adopted for facilitating the laying of foundations, are not likely to be called into use by architects, as it is seldom now-a-days that bridge-building, aqueducts, &c., come under the care of our profession.

BUILDING FOUNDATIONS ON PLANK, provided that plank be of a wood suitable for that purpose, and well charred, is a good method. But, in order thoroughly to insure its safety, it is absolutely necessary that there should be three tiers, not less than three inches thick each, with the joints broken, so as, in no case, to allow two joints to come together. On the upper tier of these

planks, the bedding-stones should be laid, as carefully as in the other cases.

The advantage to be derived from planking is in the fact, that it bridges over soft spots; and presents an equal bearing throughout, for the whole superstructure to rest upon. The only thing to be feared is, the possibility of *rot*, which is, we think, sufficiently guarded against, by the charring, if faithfully done.

We have now presented our readers with the general features of this most interesting subject; and trust, that the constantly inventing talent of our brethren may yet develop other, and still better modes of placing buildings on a firm footing, free from the possibility of lapse, check, or injury of any description. Our predecessors, in all ages, were able to build miracles of strength and beauty, whose wondrous weight must be the indubitable witnesses of the perfection of their foundations. There is no good reason why we, in our day of great enlightenment, having before us such grand examples, should not secure our buildings, beyond any peradventure of failure whatsoever.

CHEAP AND BEAUTIFUL DWELLING-HOUSES IN RURAL DISTRICTS.

BY J. S. HOUGHTON, M. D.

THE art of building cheap and beautiful cottages, adapted to the wants of rural districts, has been but little studied about Philadelphia. The vast number of cheap dwellings within the limits of the paved streets, has hitherto rendered it unnecessary, for persons of moderate means, to go any distance into the rural districts, in order to obtain a dwelling-house with a reasonable amount of space, light or air, for a comparatively small sum of money. But times have changed. The prices of lots, building materials and labor, have nearly doubled, and hence the cost of dwelling-

houses, within the built-up portions of the city, have increased in like proportion. The question now arises, where can a man of moderate means obtain a dwelling-house, with a spacious lot, at a price within his reach?

Near the city of Boston, the question has been met and answered, in a practical way, by building, in the rural districts, thousands of frame cottages, covered with wooden siding, in a beautiful style of architecture, neatly painted, generally with small gardens attached, at prices ranging from \$1,800 to \$3,000, and upwards. Many of these frame

houses cost from \$10,000 to \$20,000, and are, of course, very substantial and ornamental. The building stone, about Boston, is generally of the granite formation, or the dense, black flint, very hard and cold; and good bricks are scarce and costly; hence wood has been used for building purposes, very generally, in the country, instead of brick and stone. These Boston frame houses are constructed with great economy of lumber and labor; and are covered with two coats of boards, or siding, and one coat of hair mortar, besides the ordinary inside lathing and plastering. Even in that cold climate, they are warm, dry, and in all respects admirably adapted to their purpose.

In Philadelphia, the cheapness and excellence of our stone, brick and marble, heretofore, have induced the universal use of these materials for building purposes, until a frame house was looked upon with a good degree of contempt, as a sort of sham house, unfit for a person of any means to live in; and scarcely as property, in a respectable sense. But stone, brick and marble-masons' work, and house lots, have risen in prices to such a point, that we shall be compelled to get rid of some of our prejudices against frame houses, and look to the rural districts for relief.

There are, however, two serious objections to frame houses, or wooden houses, in the neighborhood of Philadelphia, which must be overcome before they can be adopted, very generally, with profit and comfort. The first: The fact that our long season of hot sunshine has a powerful effect upon all siding and boards of any width exposed to the sun and rain, even when the best of seasoned wood is employed. The second objection to wooden houses is: That painting is very costly; and the paints now sold are generally very poor, and soon fade, and burn off and blister under the influence of our hot suns, making it necessary to repaint every three or four years.

One method of avoiding the wooden siding and the painting has been suggested by the writer of this article, and practically tested on several large buildings. It is to cover the frame houses, after being weather-boarded, with a coat of mortar, and to finish this mortar with a colored and water-proof composition, which chemically unites with the mortar, and renders painting unnecessary. This is literally a frame house, rough-cast, and colored to resemble stone, by a water-proof and frost-proof composition. This composition is not a mastic, but a chemical paint, made soluble in water and applied with a brush, when it instantly hardens, and will positively stand sun and frost, unchanged in color, and unbroken in surface.

This composition is not a mere wash, but a chemical compound of natural substances having a strong affinity for mortar; and is applied in a particular manner, so as to avoid the objections, which may be urged against all the known mixtures of mastics, &c. The composition is also very cheap; and can be applied by any person who can use a whitewash brush. It will soon be offered for sale, in quantity, so that all can obtain it at a very low figure.

Another method of avoiding the use of paint, on frame houses, in the country, has been proposed, viz.: to cover a large portion of the walls with piazzas, and to use for siding narrow floor boards, stained or partially grained, and oiled. Under piazzas, such a finish would be very durable; and could be made, by selecting wood of handsome grain, or by skilful staining say with burnt sienna, very beautiful.

The styles of architecture adapted to houses in the rural districts have been much improved by builders in the vicinity of Northern cities. The French roof is a marked feature in most of the later cottages; and some new methods of working it have recently been introduced, which have the merit of novelty at least. The bay-window carried up

to the second and third stories; and finishing with the upper portion of the French roof, in octagon form, is also a new feature of the Boston cottage architecture, worthy of notice.

I have just built a cottage, of an irregular figure, only one story high, with a French roof, and ornamented window heads and porches, balcony, &c., constructed with a light "balloon frame" (in Western style), rough-cast and colored, as above suggested, which is open to the inspection and criticism of the curious. For myself, I feel satisfied with several of its qualities, viz.: Its goodness, cheapness and beauty.

The roof is an important and costly part of a country house, especially when the house occupies a good deal of space on the ground, which it should do. For roofing, I have found no substance equal in cheapness and excellence, to the plastic slate, a composition of ground slate and gas-tar. As a protection against rain it seems to be more perfect than tin. It is very light in weight; it costs only half as much as tin or slate; it is very durable, and unaffected by sun or frost. I have several thousands of square feet of it on my buildings.

Now having considered the construction of cheap rural houses, the next question that arises is, where shall we find cheap land near the city? I answer, for one, that at Fisher's Lane Depot, on the North Pennsylvania Rail-

road, only twelve minutes ride from Fifth and Berks streets, and very near the upper end of Broad street, in the Twenty-second ward, where there are upwards of three hundred acres of excellent land, now offered for cottage lots and gardens at a very small advance upon the price of farming land; and competent builders stand ready to erect small houses, by contract; and to build cottages for sale, in case they are wanted. In the immediate vicinity of these lands, there are upwards of five hundred acres more of good cottage sites, which can be had, at no distant day, for the same purpose. It is believed, that really beautiful cottages, of a superior quality, can be built after the Boston style of frame houses, for \$5,000 to \$7,000, including half an acre, or even an acre, of garden attached to each cottage.

On the subject of "rough-casting," it may be useful to remark, that a very large proportion of the work done in the vicinity of Philadelphia has been very imperfect in its character. A good job (and there are many such) has been generally the result of accident. Very little study or care has been given to the subject by masons. But when the work is done by a master of the art, using good lime and the right kind of sand, in proper proportions, rough-casting can be made almost as beautiful as hammered stone, and quite as unchangeable in its surface.

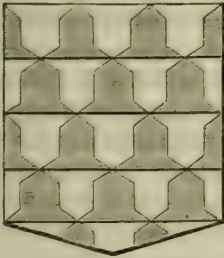
STYLE AND COMFORT,

In general domestic architecture, do not always absolutely agree. Style demands a subordination of parts, which compels additional elevation of the front or main building, thus causing communication, with the back building, or the wings, to be by means of the half-landings of the main staircases. Comfort, on the other hand, requires all the floors to be upon the same general level, so that there shall be neither descent nor ascent, of so much as a single step, in traversing all parts of any particular story. But style, even in the interior, calls for grades, represented in the ancient dais, the modern platform, or in the steps or stairs belonging to all times.

HERALDRY.

VAIR—

VAIRE, Vary, or Verry,—according to Colombiere—is the second



sort of Doubling or Fur [the first being *Ermine*] formerly used for the garments and linings of great men and knights of renown.

According to the fancy of the herald, describing this Fur, the pieces, composing it, have been variously likened to diminutive escutcheons, little glass pots, tiny bells, or the blossoms of the genus *Campanula*, such as the bell-flower, the hare-bell, the blue-bell, &c., and all these comparisons are pretty exact. The lines of these pieces are so adjusted that, taking them as shieldlets, any two adjoining ones in a horizontal row fit closely together, chief to base, or head to foot, alternately, upright and inverted.

In tincturing *Vair*, the metal and the color are applied in that alternate manner, which gives the general effect of a draught, or checker-board. Thus, opposed to the base points of any of the upright *white* escutcheonlets are the base points of as many inverted *blue* escutcheonlets. In other words, if all the *white* campanulas are upright, and arranged in diagonal rows, taken bendways, whether dexter or sinister, and disposed base point to dexter-chief-point, or sinister-chief-point, all the *blue* campanulas are inverted, thus completely filling all the spaces between the *white* ones.

There is no need of telling the number of figures of *Vair*, which are upon every rank, since it is a Fur and Doubling, where, the said pieces, being sewed on, they take the nature of figures that

are *semée*, which have no certain number over all, some hiding themselves in the upper chief line, the lower base, or either flank of the shield, and thus exhibiting but one-half their surface.

On Chiefs, Crosses, Pales, Fesses, Bends, Chevrons, Saltires, &c., when they happen to be *Vair*, it is necessary to specify the number of ranks.

Those of the original pieces, not *white*, being mostly of a *gray* or *ash* color, the nearest heraldic tincture to which would be *azure*, the heralds, settling the rules of "Armorie," determined that the pieces of *Vair* should be *White* and *Blue*, unless otherwise expressed. If any family bears the figures of *Vair*, with any other tinctures, the blazon must be : *Vairé, Or and Gules*—or whatever else—and, thus colored, the Bearing is called *Vair Composed*.

The derivation of the word *Vair* appears to be from the French *varié*, varied, or, in Latin, *a variis coloribus*, from the various colors of the several pieces sewed together, according to the honor and fancy of such as choose to bear it.

The ancient drawings exhibit several sorts of *Vair*; and it is to be observed, that there must be but *four full rows, or ranks, of Vair in the escutcheon*. If there are more or fewer ranges, they must be specified.

BEFFROY DE VAIRE has the largest figures, being made up of only three full rows. The *Beffroy* is peculiar in having its *first figure*, in the dexter chief of the escutcheon, *always of metal*; and also in its figures, Coates says, *being made in the shape of a belt*, [but this last must be a misprint for a *bell*;] whereas, those of mere *Vair* are in the shape of a glass. This can only mean, that in *Beffroy* all the angles of the pieces are rounded, so that, in effect, they are outlined in a

series of continued semi-circles, of the same radius, struck from different centres, and alternately touching the top and bottom of any particular row.

MENU-VAIR, Meniver, or Minever—from the French *menu*, small, and *vair*, the proper name of this fur, has the smallest figures, consisting of five or six rows. This is also termed *small vair*.

In Scott's ballad of the "Noble Moringer," a knightly tale of old Bohemian day, we are informed :

"It was the noble Moringer, from bed he made him
bounne,
And met him there his chamberlain, with ewer and
with gown,
He flung the mantle on his back, 'twas furred with
miniver,
He dipped his hand in water cold, and bathed his fore-
head fair."

The rhyme here shows Sir Walter's pronunciation to have been most likely technical, i. e., *mini-vair*, as he was a good herald.

With regard to the original of *Vair* in arms, it seems, from Colombiere, that a lord of the ancient and illustrious house of Coucy, in Picardy, France—taking part in the interminable wars, against the Moslem power, in the Bannat, Transylvania, and the other border lands of Christendom—once, finding his troops thrown into disorder, by the Turks, and his banner beaten down, cut out of his scarlet cloak, which was lined with *Vair*, an extempore banner; fastened it to his spear, and, uplifting it, rallied his troops; inspire them with his own indomitable spirit, and gained the day. After this, the Herald of Hungary blazoned this Coucy's arms as *Fasce Vair and Gules of six pieces*, on account of the lining and color of his very serviceable cloak; and, disusing those he had previously borne, the Seigneur de Coucy left these arms to his posterity.

Mackenzey says, *Vair* has its name from the Fur of a beast called *Varus*, whose back is a *blue-gray*, its belly being *white*; and therefore the heralds have expressed it *blue and white* in colors.

Guillim remarks, "If you observe the proportion of this *Vaire*, you shall easily discern the very shape of the case or skin of little beasts in them," [i. e., in the pieces.] Coates glosses this, with reference to Guillim, by observing, that, "The head and feet of the beast are taken [cut] from the skin."

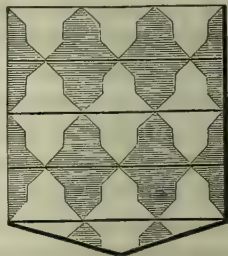
Of *Vair* is sometimes formed a cross, which Bara blazons, *Croix de quatre pieces de Vaire appointées*, that is, A cross of four pieces of *Vair*, pointing to one another. Gibbon Latinizes it thus: *Crucem e quatuor Petasis (quorum apices sunt alia versus aliam positæ) consistentum*; or, again, *Quatuor petasos (verticibus altero alterum respicientibus) in crucis modum collocatos*.

Leigh has a great deal concerning *Vair*, which other Heralds do not admit.

COUNTER-VAIR—

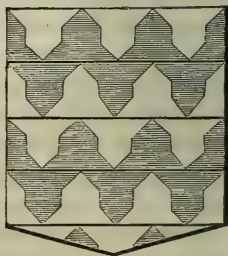
has figures shaped and arranged exactly as in *Vair*, but

they are colored in alternate perpendicular rows, so that if the *White* shieldlets range, from chief to base, upright, inverted, upright, inverted, upright &c., all touching one another, the *Blue* shieldlets next adjoining, either right or left, would run, from head to foot, inverted, upright, inverted, &c.



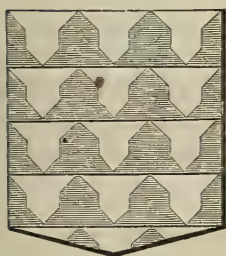
VAIR-IN-POINT—

displays component shapes like those of the two preceding; but these second, fourth and sixth rows are slipped the width of one shieldlet, either to the right, or left, both amounting to the same thing. Counting perpendicularly in rows, towards the right, (heraldic left,) this



gives alternately a row of white shieldlets upright adjoining another row inverted, the base points of both upright and inverted shieldlets, being directed towards the open spaces between them, and so on; but the colors for the upright row would run *White, Blue, White, &c.*, whereas those for the inverted ones would run *Blue, White, Blue, &c.*; or, in other words, the whole field will appear to be occupied with horizontal ranges of upright, irregularly outlined, conjoined VVVs, the ranges alternating in tinctures.

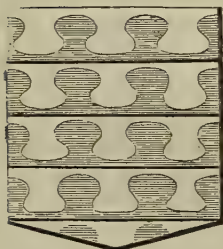
VAIR-IN-PALE—



exhibits the same outlines and positions of shieldlets as *Vair-in-Point*; but considered in vertical lines, if the *White* shieldlets are arranged, touching one another,

all upright, base, chief, base, chief, &c., the adjoining *Blue* ones, all inverted will run, chief, base, chief, base, &c. This throws the tincturing into alternate perpendicular lines of all upright *White* shieldlets next to all inverted *Blue* shieldlets, and so on, in regular order; the general coloring falling into vertical stripes, in the direction of the heraldic ordinary, or integral figure, called *A Pale*, hence the name of this *Fur*.

VAIR, ANCIENT—



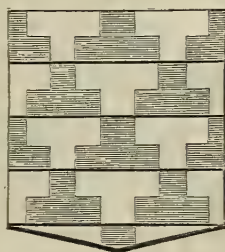
here figured from Hugh Clark, in the general disposition of its tinctures agrees with *Counter-Vair modern*, and *Vair-in-Pale*; but in all other essentials differs

from the whole four preceding. The

field is composed of horizontal bands, each of which has, meandering regularly through it, what, in Heraldry, is termed a *partition line* *NEBULY*, or, popularly, a regularly curved line proceeding in loops, vaguely resembling many carpenters' dove-tails worked together, each separate loop having the exact general shape of the dove-tails used for securing the border-pieces of children's dissected maps, pictures and games. As this line never touches either the top or bottom line of its band, *ancient Vair* is an assemblage of irregularly-regular horizontal stripes, of which every interlocking pair are bounded by straight lines. Each stripe is colored, proceeding from chief to base, *White* and *Blue*.

POTENT—

is composed of horizontal bands, each



made up of little pieces resembling crutch-heads, alternately erect and inverted. It is tinctured, checker-wise, *Argent* and *Blue*, exactly like *Vair*, and

the numbers—both of the bands and of the pieces in the bands—are optional. It is now accented on the first syllable, in all its meanings; but, as a crutch, the accent was formerly on the last syllable. In Chaucer's description of Elde, or Old Age, in the *Romaunt of the Rose*, we have:

"So old she was, that she ne went
A-foote, but it were by *potent*."

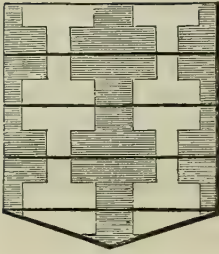
Potent is the natural companion of *Vair*; but the older name of this *Fur*, as here drawn, is most likely *Counter-Potent* or *Potent-Counter-Potent*.

COUNTER-POTENT—

OR

POTENT-COUNTER-POTENT—

the latter being the appellation mostly



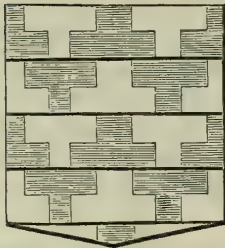
exactly like *Potent*, and composed of *White* and *Blue*, unless otherwise specified; but the tinctures to the figures are assigned to the crutchlets exactly as in *Counter-Vair*.

VAIRY-CUPPY,

VAIRY-TASSY, OR MEIRRE—

[POTENT-IN-POINT]—

has the crutchlets, shaped as in *Potent* and *Counter-Potent*, and tinctured alter-



nately *White* and *Blue*, but arranged as to color, exactly as are the shieldlets in *Vair-in-Point*; and, analogically, it would be much better, to call this Fur, *Po-*

tent-in-Point.

According to the majority of the published figures, the French call this Fur *Contre-Potencé*, which, however, is analogically better applied to *Counter-Potent*, as given just above. In English Heraldry, Leigh and others have bestowed on it the names, *Vairy-Cuppé*, *Vairy-Tassy*, and *Meirre*, all of them words without any very appropriate significance. Leigh seems to have thought that the crutch-heads resembled cups, therefore his *Vairy-Cuppy* and *Vairy-Tassy* are equivalent to the French *Vaire-Coupé* and *Vaire-Tassé*, both meaning in English *Vair*, *cuppy*, or *cup-*

like Vair. As for *Meirre*, it seems fairly amenable to Coates' adverse criticism, in all probability never having been known at all before the days of Leigh, as it certainly has been but little since.

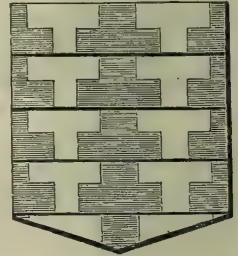
It occurs to us, however, that, by holding the shield off some distance, so as to get the general effect of the tinctures, the markings are arranged in rudely-shaped VVV's, conjoined, the same as in *Vair-in-Point*, so that, proceeding from the chief towards base, the reëntering angles of these VVV's might be thought to resemble cups. This much in possible justification of two of Leigh's terms.

Uredus renders *Counter-Potent*, in Latin, *Patibulatum*, as, *Ex hoc et illo colore patibulatum*, and Baſon, in his *Art Heraldique* has *Contra-patibulatum*; both which are proper and significant terms.

POTENT-IN-PALE—

here, and now, for the first time, heard of—would seem to be a necessary deduction from the Furs previously given and described, as analogically completing the series.

It must be remembered, that we do not treat Heraldry as a



set, obsolete, or obsolescent science; but as something with plenty of life still remaining, though hereafter, and for the United States, it will be chiefly cultivated with very different views, from those which led to its European rise and sway.

Potent-in-Pale is outlined the same as *Potent-in-Point* or *Vairy-Cuppy*, but its crutchlets are tinctured the same as the escutcheonlets of *Vair-in-Pale*.

NOTE.—The COMPOSITE TINCTURES are:—Checky, lozengy, fusily, paly-pily, barry-pily, gyronny, chappes, quarterly—or per cross—per saltire, paly, barry, bendy, bendy-sinister, per fess, per pale, per bend, per bend sinister, per chevron, and tierce—or divided in the direction of any simple ordinary such as the pale, or the fess.

THE GAZETTE.

RICHMOND GRANITE COMPANY.

THE Richmond Granite Co., whose quarry is on the James river, three miles above the city of Richmond, Va., has just quarried an immense block of granite, one hundred feet long, twenty-three feet wide and twenty feet thick, containing forty-six thousand cubic feet and weighing about four thousand tons. This large mass is in one sound piece; and is probably the largest block of granite quarried in this, or any other country.

To detach this block from the main rock, three holes were drilled, eleven feet deep by one and a half inches in diameter, into a seam that ran vertically through the rock. These holes were filled with powder and exploded in a manner to open the seam, without shattering the stone. In this seam a charge of powder was exploded, which moved the block about twelve inches. One hundred pounds of powder were used in making this blast; and so skilfully was it done, that there is no appearance of strain throughout the stone, which is now being cut into smaller sizes. In doing this no powder is used. Small holes, about two inches deep, are drilled where the break is to be made. Into these holes iron plugs are placed. The force of these plugs, when driven into the stone, is astonishing to those unacquainted with quarrying. Two hundred

and fifty of these plugs were inserted into the block, when ten men with hammers, in fifteen minutes, split the stone, its whole length and depth, as straight, as if it had been sawn. The same process will be continued, until the whole is cut into such sizes as can be transported. The quality of this granite is excellent. It is of fine grain, good color, tough and receives a brilliant polish. It is well adapted for monumental and building purposes, and has been tested by scientific men appointed by the Government, who certify to its superior quality. The quarry was extensively worked previous to the war, supplying the Government largely for its forts and other works. A considerable quantity is now being used in Philadelphia and other cities. Walnut street west of Broad, in front of the United States Mint; and various streets are now being paved with cubical blocks from this quarry. The land, from which this stone is procured, contains eighteen acres; and is a solid mass of Granite. It gradually rises from the river to an elevation of one hundred feet. It has been lately purchased by a number of gentlemen of this City, who have formed a Company. Their President is Mr. Edwin Greble, whose office is No. 1708 Chestnut street, Philadelphia.

HARRISON'S STEAM BOILER.

WE have had our attention called to a pamphlet containing an *ESSAY ON THE STEAM BOILER*, written by JOSEPH HARRISON, JR., of Philadelphia.

After a careful view of what has been done, from the beginning, in steam generating apparatus, Mr. Harrison proceeds to discuss an invention of his own,

which has now been before the public, in extended practical use, for several years.

This new steam generator seems to meet the requirements of a most difficult question, one upon which much time, mind and money have been spent for a century past.

Safe steam has been, and is now, the

problem of the hour, in the use of this agent for all purposes to which it is applied. Efforts to bring it more under control deserve, at least, to be looked upon with favor.

Whether the particular plan of steam boiler, described in this essay of Mr. Harrison, has all the advantages claimed for it or not; in its extensive and increasing use, enough has been proved to show that a steam boiler can be made, with no insuperable defects, either in its manufacture, or its action;—one that will compare favorably, in all respects, with any that has preceded it;—and—most important of all—one that affords entire security from destructive explosion, under every condition, that can arise in the use of a steam boiler.

The public, when made fully aware that entire safety can be obtained, will not long thereafter tolerate the use of steam generating apparatus constructed on the present most dangerous system; but will demand that something less perilous shall be substituted.

Interest and prejudice, those hindrances to improvement in every thing—no matter how useful or necessary—will not be allowed much longer to stand in the way, simply because these influ-

ences desire no change. In good time, when the dangers that surround us now are removed by the adoption of a safer system, no other feeling than amazement will fill the minds of those, who may chance to turn to the disastrous record of the present day. Amazement, that a remedy was not sooner found for an evil existing from the very first use of steam under pressure.

There are now, we are credibly informed, upwards of three hundred "Harrison" boilers in operation, varying from *five* horse-power to *four hundred*. From their entire safety and economy, they are peculiarly adapted to heating public and private buildings; and many are now in use for that purpose.*

In view of the great necessity for improvement in rendering steam more safe from destructive explosion, we cannot too highly recommend this invention. The pamphlet containing the essay, we have here adverted to so briefly, will be sent, postage free, to all, who may address "HARRISON BOILER WORKS," Philadelphia, Pa.

* John Kellum, Esq., Architect, New York, has put in Mr. A. T. Stewart's new store, Tenth street and Broadway Harrison boilers of *four hundred* horse power for warming and hoisting in this immense establishment.

REVIEW OF NEW BOOKS.

MORGAN'S BRITISH TRADE JOURNAL AND EXPORT PRICE CURRENT. A complete *Monthly Resumé* of all items of Interest to traders resident out of England. Square 8vo, pp. 98. 42 Cannon St., East Cheap, London.

We have received the 70th number, or that of October 2d, 1868, of this complete and exhaustive serial, for the conception and publication of which the Messrs. Morgan deserve great credit. They experience the advantages of its proprietorship, in their extensive commercial and banking business, it is true; but the work is an intrinsically good one, and not the merely sordid affair many readers might suppose, from simply seeing its title. Its leading features comprehend:—The State of the Money Market; Movements of Specie; the Course of Exchange; Prices of public and other Securities, &c.; Postal and Mail News; Shipping Register, Rates of Freight, Vessels Loading, &c.; Review of the Produce Markets, with Prices Current and Statement of Imports and Stocks; Drug and Chemical Circular; Reports of the Markets for Oil, Tallow, Hides, Provisions, Corn, Fruit, &c.; Metal and Hardware Trades Report; Textiles and Textile Fabrics Tobacco Circular; the Wine and Spirit Trade; Stationery

Circular; and Book Lists; together with frequent complete Illustrated and other Price Lists of Manufactured Goods.

In addition, it embodies many articles of interest to the general reader.

CLAXTON, REMSEN & HAPPELFINGER have laid on our table the following very acceptable presents for youth, to which we would call the attention of our readers:

THE BUTTERFLY'S GOSPEL, AND OTHER STORIES. This is a charming little book, containing three gems of Frederika Bremer, translated by Margaret Howitt, in 60 beautiful pages, elegantly illustrated, and temptingly bound in green and gold.

WASHED ASHORE; OR, THE TOWER OF STORMOUNT BAY. An interesting and well-told tale of 124 pages, by William H. G. Kingston. Striking incidents artistically illustrated, and dressed in that tasteful topography and attractive binding, for which the publishers are firmly establishing a name for themselves. We commend *Washed Ashore*, with its many and excellent illustrations, to the juvenile public.

THE
ARCHITECTURAL REVIEW
AND
AMERICAN
BUILDERS' JOURNAL.

CONDUCTED BY SAMUEL SLOAN, ARCHITECT:

ASSISTED BY CHARLES J. LUKENS.

VOL. I.—Entered according to Act of Congress, in the year 1868, by Samuel Sloan, in the Clerk's Office of the District Court of the United States, in and for the Eastern District of Pennsylvania.

MONTHLY REVIEW.

THE NEW YEAR.

ALREADY are we met, on all sides, with greetings most kindly, which go to prove, not that our publication is of itself an entire success, literally and artistically; but that there was a much-felt want of such a serial, essentially National, in our midst.

And here, let us thank those kind contributors who have assisted us with their acceptable articles, hoping they will continue their acquaintance, and add that of many others. The cost of an undertaking like the present is, as a matter of course, considerably more than that of a mere literary magazine. It will, therefore, be our aim and purpose to present our patrons with matter that will be at once useful and attractive to all classes of the community.

The public, generally, are too apt to look on our subject-matter as *black letter reading*, only adapted to geometricians, designers, and artisans. Yet, strange to say, there are no more generally noticed productions than those which emanate from the very science we treat of. The eye of the most inconsiderate wayfarer is ever arrested by the appearance of a new building; and such is

certain to call forth a decision on its merits in his mind, be he learned or otherwise. Now, the question arises, as to why this independent criticism, possessed and more or less exercised by all, should not have the advantage of cultivation, by the reading of publications on the subject. Why should any sensible man, or woman, be content to look on a fine building, and even be in the constant habit of seeing such from infancy, yet not know what it is in its appearance that pleases or displeases. Are there not millions of human beings, reared in cities, endowed with the sense of sight, and possessing a natural power of discrimination, who never ask themselves the question, What art is this that has created these palatial grandeurs—from whence did it spring—and how is the knowledge of it acquired? It is the work of man, and all men are interested in it. Why then is not the study of Architecture more general?

It is by educating the community up to the required standard, that we may hope to overcome this general ignorance and apathy of our fellow-men; and one of the means of such education is this,

which we present, from month to month, in the form of a REVIEW.

That it becomes a duty, on the part of our professional brethren, to help on this undertaking, their own pride in their art will prompt them to affirm. Let the effort be a vigorous and continuous one; and it cannot fail of drawing the attention, sooner or later, of the public at large.

When Mr. J. C. Loudon first published his "Architectural Magazine," in the great metropolis of England, in 1834, it was with difficulty that excellent serial was made to live, even there; although it was the only publication of the sort in existence. Mark the difference in thirty-five years. That effort worked in a small way; but it *did* work; and we see the good derived from its teachings now; not alone in raising the standard of the profession; but in gathering around it a noble column of educated amateurs and admirers, whose cheering support has placed it in the prominent position it now holds in England.

The wave of intelligence has surged to our shores, and we, too, in the hitherto distant America, feel the influence, and warm up to the occasion.

The London "Builder," and the several other admirable issues of English architectural periodicals have a good circulation in the United States; but they do not meet all the requirements of our country. There is an essential difference between the climates of the old and new continents; and this fact has given birth to a distinction in architectural composition, as well as to the relative requirements of construction, which renders the theory and the design of the one, in a great degree useless to the other.

The long and growing experience of this want of an adequate representative of National taste in Architecture, prompted the production of our REVIEW; and the flattering support it has already received is a sufficient assurance of the necessity for its appearance, as well as

of the determination to sustain it, in a manner at once worthy of its mission and of its importance to the public and the profession.

What we have done, in the six months past, is but a feebly growing proof of what our desire is; and we know that the realization of our cherished dream is dependent on that very support we are now so generously receiving. With regard to our illustrations we have a word to offer: Engravers, in this country, have not as yet seen fit to pay much attention to the study of Architecture, and especially in the minutiae of its details. Now, as it is impossible to do more than produce *effects* where the smallness of the scale renders details barely perceptible; it is evident that a knowledge of the subject is actually imperative on the engraver, who must treat his work as an architect and an artist. How very seldom do we see this done in any thing approaching perfection even in the works of eminent European wood engravers; although, we must say, the improvement in late years is very great. How then could we expect of our wood engravers to do these things by intuition? The fact is, we must educate them in this matter; and when they see, that, to be reliable in their art, they must make Architecture a study, with a view to its relation to their own requirements, and that such study is remunerative, there is little doubt but they will produce illustrations satisfactory to the designer and pleasing to the public. It is our intention to advance the art of wood-engraving in this, which we may call our own department. And we have hope that yet our engravings will equal those of France or England. It is for us and our patrons to bide the good time coming.

With these remarks, we make our New Year's bow, in the pleasing assurance of kindly support and enduring friendship, looking forward with confidence to 1870, as to a bright station on the progressive course.

THE MINSTERS OF ENGLAND

IN the history of Christendom, there is no epoch more interesting, than that which marks the early days of anti-pagan struggle; and the monuments, which are yet left to the Nineteenth century, of those times when the great and the good AUGUSTINE struggled for the Truth, are surely well worthy of preservation in substance and in memory. Britain is not backward in the effort to retain those monuments of the past, to adorn the present; and well may she be proud of the eminence of her ecclesiastical history, as well as the beautiful examples its architectural testimonials present to the world.

The fervor of piety and religious zeal, which pervaded every class of the primitive Christians, was the great lever that upraised the ponderous works of worship to the Most High, which, even now, claim the refined admiration of a highly cultivated age. History tells us, that every succeeding era, and almost every succeeding prelate and abbot, seemed to regard it as necessary, or politic, to make some addition, or attach some new adornment to his church. Thus, in the midst of gloomy ignorance, the cultivation of the beautiful, elegant and dignified in art, is to be found standing alone in the form of the Architectural wonders, one of the chief of which we now draw the attention of our readers to.

CANTERBURY CATHEDRAL.

This ancient ecclesiastical edifice is placed in a flat level part of the country; and has therefore no picturesque advantages of situation. It is seated near the northeastern extremity of the city; and was formerly surrounded by a lofty embattled wall, said to have been raised by Lanfranc, which enclosed the whole precincts of the church. These walls extended about three-quarters of a mile; and were provided with fortified gates.

Parts of the gate-houses yet remain, to show their sizes, forms and destinations. To account in our day for the existence of these fortifications, it may be well to remind the reader, that, in the early times of this great cathedral, paganism prevailed to such an extent, as, in a great measure, to over-awe the Christian portion of the nation. Hence the necessity for being guarded against sudden attacks on the great centre of the church.

Externally, Canterbury Cathedral presents great diversity of form, character, and appendages. At the west end are two towers of disproportionate sizes, heights, forms, ages, and features; between which is a central division, with a porch and doorway at the bottom, a large window above, and a window of a singular form, almost square with rounded upper corners and small curved ears, in the pediment. The north-western tower diminishes towards the upper story. It has merely flat pilaster sort of buttresses, and is constructed with small squared stones.

The southern side of the church presents various and diversified features, forms, and styles. It is of great length and height; and is divided into several dissimilar parts. Between the western and centre tower is the nave and its aisle, with lofty windows to the latter. Between these windows are bold, strong buttresses to the aisle, connected with flying-buttresses to the upper story of the nave. Each of these buttresses is divided into three tiers, or stages; and is crowned with a pinnacle. Projecting, at right angles, from this aisle is the south wing of the western transept, which has one large window, on the west side, ranging and corresponding with those of the aisle; also, a larger window, to the south, of eight dayes, with transoms and much tracery in the arch. The pediment is adorned with paneling

and tracery mullions. At the southwest angle is a newel staircase, surmounted by a very rich octangular pinnacled turret. At the junction of this nave and transept with the choir is the great central tower, which is distinguished for magnitude of form and decorative finish. At each corner is a sort of octagonal tower, the angles of which are finished with squared mouldings, or pilasters, crowned with pinnacles. Between these eight pinnacles rises an octagonal turret, finished by a spire pinnacle.

The sides of the tower are occupied by two deeply-recessed windows in each story, divided by a pilaster, and each pair again separated by mouldings, panels, &c. Branching from this transept eastward is an extraneous building, having a monumental chapel on the ground floor, and an apartment above.

The north side of the cathedral, in general arrangement and members, very nearly resembles the south, but the whole cannot be seen, some old buildings modernized, and new buildings, without any architectural features, now occupy most of the ground very near the whole of this side, from the principal transept to the east end. From the southwest the most extended view is obtained; but this merely embraces a part of the church. It is necessary to move to several stations, at different distances, to inspect the whole of the south side. Still from the circumstance of its having two towers at the west end, one in the centre, of large and lofty character, two others combined with its eastern transept, from the variety of lines and forms, from having two transepts and projecting chapels, and from the singularity of the circular tower at the east end, and diversity of styles, forms, and characteristics in its many members, Canterbury Cathedral cannot fail to arrest the attention of every inquisitive stranger, and arouse more than common emotions in the mind of the architectural antiquary.

Viewed externally, the Cathedral un-

der consideration is a powerful exemplification of the capabilities, varieties and merits of Christian architecture. Considered in its historical relations, as well as in its architectural characteristics, it naturally awakens associations and expectations of varied and impressive interest.

The interior is by far more impressive and interesting than the exterior. It consists of a nave and aisles, a short transept with two chapels, a choir and aisles elevated above the level of the nave by a flight of steps; another transept of larger dimensions than the former, with two semi-circular recesses on the east side of each, and two square towers to the west; a presbytery, east of these, with steps to the altar and aisles continued; two chapels on the north and south sides of the altar, flights of steps behind the altar to the Trinity Chapel, which has aisles; and a circular building, called the baptistry. Between the latter and the cloister is a long passage, with old semi-circular arches, connecting the Cathedral with some very ancient buildings to the north.

On entering the church, from the south porch, the stranger is immediately impressed with the loftiness, narrowness, solidity of piers and arches, and uniform beauty and harmony of the *nave* and *its aisles*. On each side of the nave is a series of nine clustered columns or piers, sustaining the wall of the triforium, which is closed except by a few small openings. Over these is a row of clerestory windows. The aisles are lofty and narrow; and the windows partake of the same character; but the whole is marked by solidity and strength.

The whole western end of the nave is occupied by a large, handsome window, divided into seven upright bays, by six mullions; and again divided horizontally into six compartments, or series of openings, with *cinque-foil* heads. The window is filled with painted glass, representing full-length figures of saints,

apostles, sovereigns, armorial bearings, &c.

The four arches of the tower are lofty, light, and elegant; and the columnar piers on which they rest manifest strength and durability. Above the arches are panels in the spandrels, a row of blank windows, communicating with a gallery in the wall; and above this tier is a series of eight lofty windows, two in each face, forming a lantern in the tower. From the angles and centre spring numerous ribs, forming a fine display of fan-tracery, with a circular opening in the centre. This opening is about six feet in diameter; and was formed for the purpose of admitting bells, and building materials to be raised to, or lowered from, the upper part of the tower. A flight of several steps leads from the nave to the choir and its north aisle; and another series communicates from the wing of the south transept to the south aisle of the choir. On the right of the latter is a descent to the crypt, whilst another approach to the same is by steps in the north transept. These numerous and various flights of stairs, as well as the different levels of the nave and transepts, with a choir and crypt, constitute peculiar and very picturesque features in the edifice now under notice. In looking up these steps, from the nave, and down from them, into either transept, or up the nave, or obliquely through the retiring arches, many interesting and beautiful views are obtained. At the top of the steps is the elegant and highly-enriched royal screen or organ gallery, which may well be designated royal, not only from its splendid style of sculpture and enrichment, but on account of its kingly statues. Among the many splendid organ-screens of England there are few excelling that of Canterbury. It is a fine specimen in design, and beautiful in execution. Its western face presents an arched doorway in the centre, with a series of three niches on each side, having a pedestal, canopy and statue to

every niche. The effect of this opening, with its many mouldings and ornaments, is striking and beautiful. It consists of a series of receding arches, some rising from columns, and others being continuations of mouldings from the floor. The inner arch is considerably reduced in height by a screen covered with tracery and niches, which rest on an arch richly adorned with sculpture. This appears to have been an afterthought, or contrivance, merely to reduce the size of the door; and, though it may be considered an ingenious and rather pleasing design, if the filling up had been absolutely necessary, yet it only breaks in, and injures the beauty of the doorway. In the other features of this doorway, and particularly its spandrels, there is much to admire, and therefore worthy of imitation.

In turning away from the organ-screen the spectator takes a fresh glance at the nave, with its fine western window, looks up with admiration at the lantern, scrutinizes the buttress-screens between the arches, and then casts his eyes left and right, to descry the characteristics of the south and north transepts. The former of these has been already noticed; and the latter may be said to resemble it in general form and detail; with the exception of some varieties in its monuments, open screen to the Virgin chapel, entrance to the crypt, and doorway to the cloisters. This transept is the memorable scene of Becket's martyrdom; and is therefore viewed with strong emotions of very differing natures by the spectators. The architectural antiquary will have other and more pleasing sensations in examining the beauties, and even wonders of the architecture around him.

At the east end was an altar, now destroyed; but some very elegant pedestals and tracery still remain to show the original style in which the chapel was finished. The fan-tracery of its roof is also a proof of its original character. From shameful dilapidations, and the

introduction of several tasteless monuments, this sacred building has been greatly injured. Among these deformities the spectator cannot omit to notice and reprobate the design and effect of an altar-tomb, the side and ends of which are covered by a mass of sculptured representations of *human bones*!

The choir, with its aisles, is dissimilar in style, character and forms to any other part of the church; and, from the authenticated particulars of the time of erection, is peculiarly interesting to the architectural antiquary. Over the range of arches of the choir is a triforium, consisting of a series of arches with clustered columns; over which is the clerestory. East of the choir to the altar is the presbytery, which corresponds very nearly in style of columns, arches, &c., with the choir.

At the eastern extremity of the aisles, as well as behind the high altar, are three flights of steps leading to the Trinity Chapel. This is a very fine and interesting part of the building. Its style of architecture has the united characteristics of the latest circular, with its solidity, solemnity, and stability, and of the first pointed, with its more light, lofty, and tapering forms.

Perhaps there is not a building in England, or on the Continent, to compare with Canterbury. Its crypt and columns, with the vaulting and floor; the columns above, with their superincumbent arches, some semi-circular, some pointed, the style of the triforium and clerestory, also the side walls, windows, aisles, vaulting, roofing, buttresses, &c., separately constitute so many fine features of Christian Architecture, and collectively exhibit a masterly and novel design, calculated to delight and gratify both the architect and the antiquary.

In the midst of the Trinity Chapel was formerly placed a gorgeous shrine and chantry raised to Thomas A'Becket, or "St. Thomas the martyr;" and here pilgrims and devotees of all nations and conditions were wont to resort, to offer

up prayers, and present oblations. The paving-stones around the shrine are said to have been evidences of the frequency of devotional kneeling, by being worn nearly through.

The immense value and ostentatious splendor of Becket's shrine are thus described by Erasmus, who saw it after the dissolution: "In a chest or case of wood was a coffin of gold, together with inestimable riches, gold being the meanest thing to be seen there; it shone all over, and sparkled and glittered with jewels of the most rare and precious kinds, and of an extraordinary size, some of them being larger than a goose's egg; most of them were the gifts of monarchs."

We will here present our REVIEW readers with a curious but authentic account of some of the pilgrimages to *Thomas A'Becket's Tomb*:—In 1177, Philip, the Earl of Flanders, visited Canterbury, with a numerous retinue, and was met by King Henry II., (who is said to have instigated the murder of Becket.) Next came William, Archbishop of Rheims, with a train of followers; Louis VII., King of France, visited the shrine in 1179 in a pilgrim's garb, and was met by the nobility of both nations, as also by the English monarch. The French monarch presented a rich cup of gold, with the famous jewel called the *Regal of France*, which was afterwards seized, during the confiscations of the Reformation, by Henry VIII., who had it set in a thumb-ring. The French King also granted one hundred tuns of wine, to be sent annually by himself and his successors. Other monarchs and nobles followed this example. But the most remarkable of all the pilgrimages to the shrine of the murdered Archbishop of Canterbury was that of the English King Henry II., who voluntarily submitted himself to the following penances, as described by Lord Lyttelton: "The King approached Canterbury, and alighting from his horse, walked bare-

“foot for three miles over rough broken stones. He prostrated himself before the tomb, and remained some time in prayer, directing the Bishop of London to proclaim to the people, that he was not accessory to the death of Becket. He then commanded all the monks to scourge him; and afterwards continued his prayers at the tomb, where he remained all day and night on the bare stones and without food. He was clad in sack-cloth, and after paying his devotions to all the altars of the church, he bequeathed a revenue of forty pounds a year for wax candles to be always burning about the tomb. He then returned to London, exhausted and ill.”

Opening by a lofty arch from the aisle of the Trinity Chapel is a curious building, a sort of appendage to the Cathedral, called *Becket's Crown*.

A passage from the north end of the east transept communicates with the library, deanery, prebendal houses, &c. At an angle of this passage is an ancient octagonal apartment, containing an elaborate font, and known by the name of “Bell Jesus.” This name was given in consequence of its having been built in imitation of a large bell.

The parts of the church remaining to be noticed are the *Crypt*, cloisters, and chapter house. The first may be regarded as the largest, the finest, and the most interesting in England. In extent, construction and ornamental detail, it must excite the unqualified admiration of the architect and antiquary. Whilst the first may derive from a minute examination of it much useful knowledge, in designing for foundations, piers, and vaulting; the latter will find in its architectural style and adornment a fertile theme for inquiry and speculation. The age of the oldest part, that from the western end to the eastern extremity of the circular aisle, has not been ascertained; and consequently is a source of controversy. Some refer its erection to the Anglo-Saxons, others to the first

prelate under the Norman dynasty. But others again insist that it was executed by Lanfranc, the architect of the Cathedral, and the protégé of William the Conqueror.

The great crypt consists of a large central space, between a continued range of square piers, from the west to the east end, divided into three parts by two rows of small columns. Another aisle, or open space, extends all round the outside of the piers; and is bounded by the outer wall. Branching off from this aisle are two vaults, or open spaces, with a single column in the centre of each, and semi-circular recesses on the east side. The northern transept has a doorway and arched passage, which formerly communicated with the priory. Its vaults have only plain ribs from column to pier, with plain vaulting between.

There is a regular entrance doorway in this transept, by a descent of steps, being the approach to a church, or chapel, which has been fitted up in the south aisle of the crypt; and appropriated to a sect of Walloon and French refugees, some of whom sought refuge in this city from the cruelties of the Inquisition in the time of Edward VI.

At the semi-circular end of this crypt is a part inclosed by a screen, which has lateral doorways. This was a chapel sacred to the Virgin, and from the style of the screen and altar, was formerly an elegant inclosure. “This chapel,” says Erasmus, “was not shown, but to noblemen and especial friends. Here the Virgin Mother had a habitation, but somewhat dark, inclosed with a double sept or rail of iron for fear of thieves; for, indeed, I never saw a thing more laden with riches: lights being brought, we saw more than a royal spectacle. In beauty it far surpassed that of Walsingham.” Immediately behind the Virgin Chapel and semi-circular range of columns are two very large insulated columns, before noticed, that are evidently subsequent to the crypt; and yet are of a very early

date. Their office and purport are not immediately apparent; but we may be sure they were not placed there heedlessly or wantonly.

Near the semi-circular end of the great crypt are two chapels projecting from the outer walls. That on the north side is used as a private cellar; and the other to the south is a dark, dank vault. The inner or semi-circular end has been completely walled up; but on a recent examination was found to be ornamented with much painting on the roof and walls.

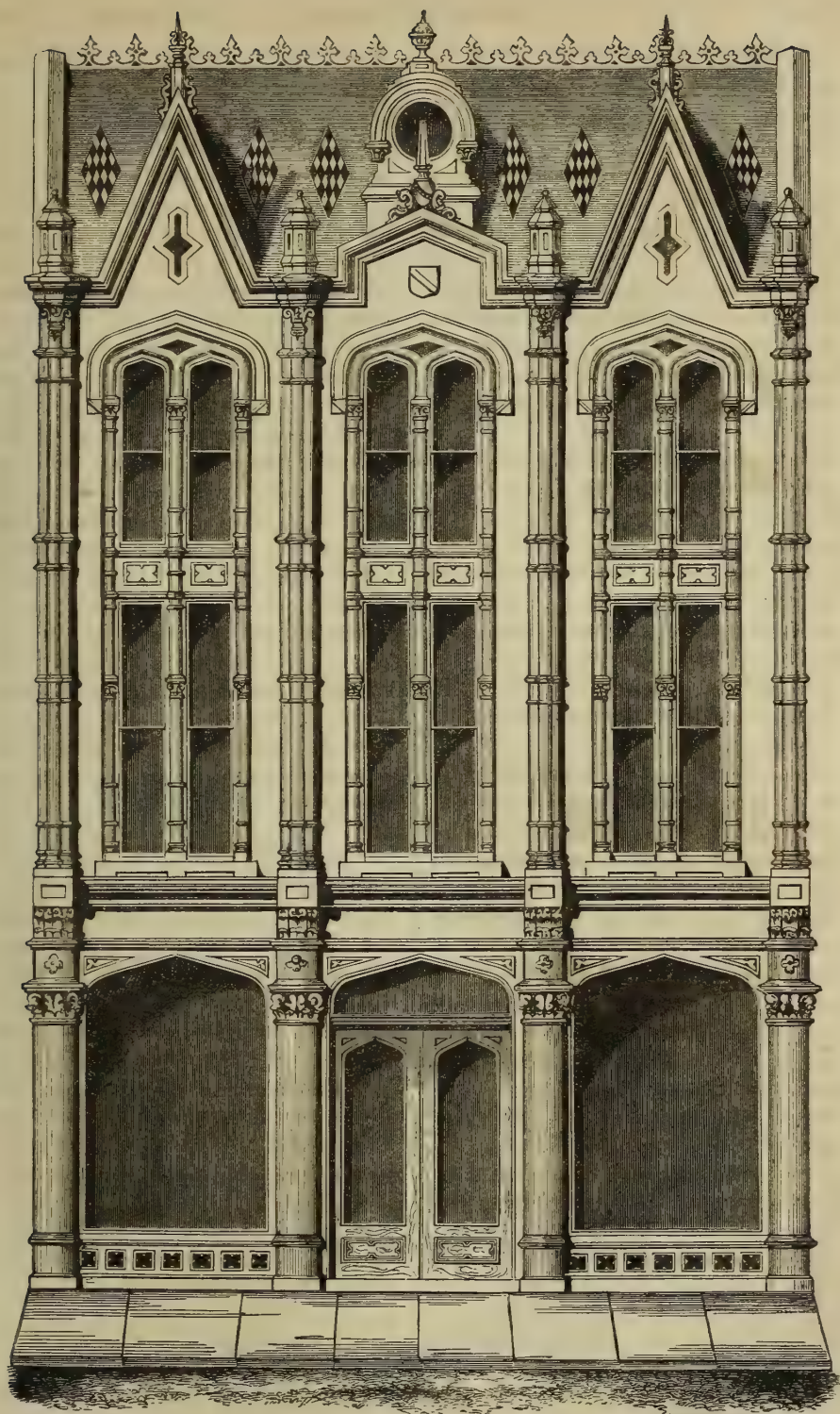
East of the crypt already described, and communicating with it by a double arch in the centre, having a double column between, and two lateral arches, is the crypt under the Trinity Chapel, the plan of which assumes a very uncommon form, nearly that of the usual horse-shoe arch. Its vaulted roof is sustained by a series of eight large, double columns; with two small slender columns in the middle.

Emerging from the crypts, we cross the locality of the martyrdom and find ourselves in the great cloister, a large quadrangular ambulatory, or covered walk, with a wall on one side and a series of open windows, with mullions and tracery on each of the other sides. The effect of light and shade in these vast crypts is remarkable. The contemplative mind has here much to dwell upon. The massive piers sustaining the solid groining, suggesting to the beholder the greatness of the pile which rises on such shoulders. The solemn, gloomy grandeur which reigns in silence in this place or tombs, where the ashes

of the proud are sheltered alike with the modest dust of the worthy dead. All seems a deep, dark dream of the far by-gone, an enduring lesson in the book of time. The skill of man is here made to rear alike a monument and a rebuke to human vanity. What a colossal undertaking the whole Cathedral was! The plan carried out is very nearly the same that the architect first laid down the lines of. Thus showing that the idea was gigantic from its very inception; and these crypts which we now review are the foundation of the mighty Minster as it was to be, and is. Centuries have rolled away since the stupendous work was first laid upon its footing-courses, and generations have crowded into the book of Time, by each and every one of which some interesting page of choice historic lore has been added, to help tell the story of this Minster. Its venerable towers, in all the graceful grandeur of architectic skill, sing from their bell-chambers the pleasing yet melancholy music of memory which ever still recalls

"The light of other days."

Canterbury Cathedral is rich in mosaics, and stained-glass: and its mural and other monuments are so numerous, and so worthy of notice, that it would be absurd to name any. We will, therefore, take our leave of this grand old Minster of the Metropolitan See of England, from the days of William the Conqueror to our own, with a mind filled with suggestive reflections on the mutability of all human affairs; ecclesiastic as well as laic.



TUDOR-GOTHIC STORE.

DESCRIPTIONS

TUDOR-GOTHIC STORE.

IN continuation of our purpose, to furnish a series of designs, which may be likely to gratify all tastes, and illustrate every variety of style, we have, in the present number, given one for a Store front, in the *TUDOR-GOTHIC* style of architecture, which would be well adapted, either for a wholesale, or a large retail, business establishment.

Before entering into any description of our illustration, which, however, does not call for a very extended one, we will very briefly touch upon the style in which it has been designed.

The Tudor-Gothic has been also, by different authorities, and at different periods, called the "*Florid English*," "*Perpendicular English*," and "*Florid, or Late, Pointed*." The period during which it prevailed was from 1460 to 1537, and embraced the reigns of the following sovereigns of England: Edward IV., Edward V., Richard III., Henry VII., and Henry VIII.

There has been much diversity of opinion, as to the exact limit of the application of this term of Tudor; but, in a general sense, it refers to the style, which prevailed during the Tudor dynasty. It is not necessary for us, however, here, to enter into a discussion on the distinctive characteristics, which gave rise to the different divisions, in which this era has been portioned. Suffice it to say, that the more general opinion is, that the distinction which exists between the buildings put up at the commencement and towards the close of the dynasty is sufficiently marked to warrant the designation, "*Early Tudor*," and "*Late, or Elizabethan Tudor*," which are now applied to them.

The characteristics of the preceding era, the *Ornamented English*, were not altogether abandoned, but mixed up and diversified with new and peculiar ones. Some of these innovations in the earlier part of the style were the introduction of Gate-houses, beautiful Bay and Oriel Windows, Turrets, and elaborate brick chimney shafts, and a general profusion of ornamentation and decoration, in the way of mouldings of brick-work and terra-cotta, medallions, heraldic devices, &c., dispersed throughout the buildings.

Previous to the commencement of the Tudor dynasty, the civil wars, which so long devastated England, had their influence on the architecture of the period, compelling the people to pay more regard to their dwellings being secure and strongly fortified, than to possess any features of elegance. But when peace once more reigned throughout the length and breadth of the land, men began to pay attention to making their mansions more attractive and elegant, and less castellated and fortified in their appearance.

Towards the end of this dynasty, or what is called the *Elizabethan Era*, there began to be a manifestation of a mixture of Italian details with the Gothic features; and, although the style is remarkably picturesque and ornate, it is open to criticism on the ground of the taste being defective and the construction unscientific.

The subject of our illustration is, as will be seen, a building three stories in height, with an attic. The façade is divided into three sections, the centre one of which is surmounted by a low pediment, enriched with an ornament above. The two side sections have

pointed gables, furnished with spear-head terminals.

The store section is divided from the superstructure by a cornice supported by half-round Gothic columns, with caps, elongated frieze, and consoles. The dentiled cornice being composed of string courses, fasciæ, &c., and the consoles being foliated. The superstructure is composed of three sections separated by piped pilasters with bands, foliated caps, &c., sustaining the main cornice, with foliated consoles.

The attic has a circular dormer, with

Gothic hood and ornamented finial. The roof is ornamented with iron combing, in character with the style. The windows of the store section are flat-pointed Gothic; and those of the superstructure are continuous, and in two stories, Gothic headed, divided in the stories by ornamental paneling, and with pointed hood mouldings.

The whole is calculated to present an unique appearance, being sparingly ornamented—in order not to run up the cost unnecessarily—yet sufficiently so to produce a desirable effect.

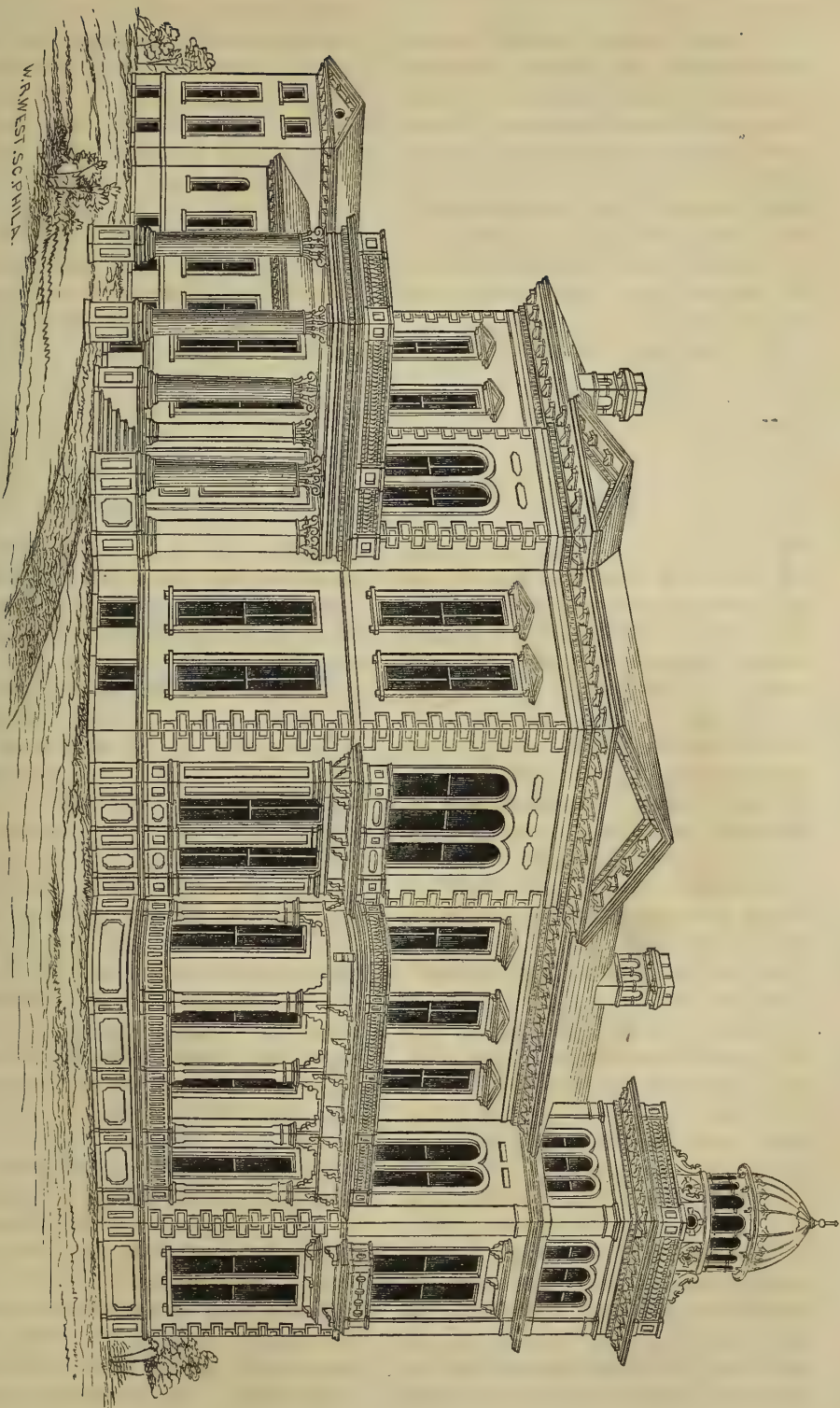
ITALIAN VILLA.

THE beauty and elegance of the Italian style—together with its appropriateness and ready adaptation to every kind of building, both as regards construction and ornamentation—have made it a very favorite style in this country, as well as in England. For suburban residences, and villas, it stands pre-eminent among all other styles, as it can be made to suit the taste or the caprice of any, either the lively or the dull, the sombre or the gay.

Its existence dates back to the Fourteenth century; but it can hardly be said to have prevailed to any extent, until the Fifteenth century. Hence it has been sometimes called the *Cinquecento Style*, the origin of which has been described to be as follows: *Cinquecento* means, literally, *five hundred*; but it is used as a contraction for *fifteen hundred*, or rather for *one thousand five hundred*, by the omission of the word *mille*, thousand. The Fifteenth century was that in which Brunelleschi was so instrumental in establishing his new style: hence its use in this sense. To Brunelleschi and his brethren of the art—who flourished between his time and that of Michael Angelo; and who composed what is called the “Cinque-

cento School”—we are indebted for the perfection and refinement of Italian Architecture; for in our day, beyond mere variations in detail, little is changed from what were the leading principles of the style, as handed down by them. The works of Alberti, Serlio, and Palladio, treating on the subject, which were translated into many European languages, soon effected a radical change in the art of building; and, through the active instrumentality of such men as Inigo Jones and Christopher Wren, the style became an accomplished fact, throughout Europe, soon after the middle of the Seventeenth century. It has ever since retained its hold upon the tastes and feelings of the people; and, as we have before remarked, is unrivalled, especially in its adaptation to the requirements of Suburban architecture.

Most generally Italian villas have an irregularity of outline from every point of view. The roofs are never steep; and the eaves are always heavy and projecting, being supported by brackets and cantalivers of diversified patterns. The chimneys are very prominent; and serve to give greater variety and effect to the outline. The windows are double,



WEST SIDE.

VILLA.

or treble, and together with the doors, have either square or arched heads, according to the importance of their position. The roofs are Tuscan, projecting considerably beyond the face of the walls, and serving to protect them against the inclemency of the weather. The Portico, or *Porte-Cocher*, has a flat roof and a balustrade.

The most prominent and striking characteristic, however, of an Italian Villa, is the *Campanile*, so called from *Campana*, a bell. These towers were at one time very generally adopted as a mark of nobility; but have now become an almost universal adjunct to an Italian Villa, tending to enliven the general appearance; and affording an elevation, whence to view the surrounding scenery. Sometimes on these towers are placed "Belvederes," or "Look-outs," for the purpose of affording a still more extended prospect; and these serve as an ornamental feature in the design likewise, to beautify the landscape. Belvederes are very common in Italy and France; and some of them are very magnificent. The most celebrated one is that built by Bramante in the Vatican.

In addition to the foregoing leading characteristics, we may briefly enumerate a few others, such as bay-windows, which are frequently made use of; heavy door and window dressings, having a tendency more to bold than to minute details in ornamentation; and heavy arcades, verandahs, balconies, antæ, pilasters, quoins, rustic work, and string-courses. All these are to be met with, according to the taste and fancy of the designer.

The subject of our illustration is a design for a Suburban mansion, in almost pure Italian style. A very cursory examination will show, that many of the characteristic features, which we have just been discussing, are exhibited in this Villa. We have the *Porte-Cocher*, or Portico, sixteen (16) feet by twenty (20) feet, resting upon Corinthian col-

umns and antæ, being of sufficiently ample dimensions to admit of carriages driving through. This Portico has a flat roof and a balustrade, forming an extensive balcony to the room immediately over the entrance vestibule.

We have also the low Tuscan roof, with the heavy projecting eaves, resting on brackets and cantalivers. The chimneys, too, are prominent and ornamental, serving to vary the outline.

There are Balconies, as will be seen, to the windows on the side, together with a Verandah to the Drawing-room, with a balustrade, the roof of which forms an Ambulatory to the Chamber immediately over the Drawing-room, in the second story.

The Campanile also is present, not, however, of the usual height, in villas of this style; but its comparative lowness is amply compensated for by its being surmounted with an elegant and light Belvedere, which adds grace and beauty to the picture.

The whole design presents a regular and symmetrical appearance, broad, heavy, and spreading. If desirable, it might at any time be extended; but, in its present state, we think it would admirably answer as a Family Mansion; and is capable of being made very complete and comfortable.

Before proceeding with a description of the plan of the first story, we will give briefly a few of the principal dimensions. The front of the Villa is fifty-six (56) feet in length, with a depth in the main building of seventy-six (76) feet. The side portion, in which are the Kitchen and Servants' apartments, is forty-nine (49) feet long, by thirty-six (36) feet deep. The height of the first story is fifteen (15) feet, and of the second fourteen (14) feet, both in the clear. The extreme height of the Tower up to the apex of the Belvedere is sixty (60) feet.

We will now proceed to describe the plan, although it requires very little explanation, as it speaks for itself. Through the Portico we enter the Lobby, A,



twelve (12) feet by twelve (12) feet, and beyond, the Vestibule, B, eight (8) feet by twelve (12) feet. On the left hand, entered from the Vestibule, is the Reception Parlor, I, eighteen (18) feet by nineteen (19) feet, having two windows looking to the front, and one on the side. On the opposite side of the Vestibule is a door leading into the Sitting-room, D, eighteen (18) feet by twenty (20) feet, having two windows on the front, and a bay-window on the side, with two lights.

This room communicates, by means of folding-doors, with the Drawing-room, E, a fine, capacious apartment, eighteen (18) feet by thirty-three (33) feet, having a Verandah accessible by the three side windows, which extend for this purpose to the floor. A door leads from this room into the main Hall, C, which is twelve (12) feet broad, by thirty-two (32) feet long; and immediately opposite the door into the Drawing-room is the main Stairway, J, a fine

broad flight, which forms a very important and striking feature in the internal arrangement of this story. Proceeding on through the Drawing-room, we find it communicates, through folding-doors, with the Library, F, at the rear of the house, sixteen (16) feet by twenty-seven (27) feet, which is well lighted by means of three windows looking to the rear. This room communicates, on the right, with the Study, G, a fine room, eighteen (18) feet square, forming the first story of the Tower. The study has two twin windows, one to the rear, and the other to the side. On the opposite end of the Library is another door communicating with the Dining-room, H, a large room eighteen (18) feet by thirty-four (34) feet, which is also entered from the main Hall, as will be seen. This completes the main portion of the Building.

The side building is entered by a door, from the Dining-room, leading into a five (5) feet passage, K, which runs the entire length of the building; and from which are accessible the various rooms on either side; and at the end of this passage is a door leading out of the building. In the side building, L is the Butler's Pantry, twelve (12) feet by

thirteen and a half ($13\frac{1}{2}$) feet, communicating also with the Dining-room. M is the Store-room, eight (8) feet by thirteen and a half ($13\frac{1}{2}$) feet. N is the Kitchen, eighteen (18) feet by thirteen and a half ($13\frac{1}{2}$) feet, well lighted, and provided with range, boiler, and sink. O, adjoining, is the Scullery, eight and a half ($8\frac{1}{2}$) feet by thirteen and a half ($13\frac{1}{2}$) feet, with a door at the rear. On the other side of the passage is S, the Laundry, fifteen (15) feet by sixteen (16) feet. Adjoining this is the Cellar flight of stairs. R is the Servants' Hall, thirteen and a half ($13\frac{1}{2}$) feet by seventeen and a half ($17\frac{1}{2}$) feet, with a closet attached. P is a private flight of stairs to the upper story.

The cost of such a building, in the vicinity of Philadelphia—finished, and provided with all modern conveniences—at the existing rates of labor and materials—would be about forty-six thousand dollars, (\$46,000.) It will accommodate a family of sixteen persons, including domestics.

This is given as a guide, whereby may be calculated its probable relative cost in other localities, where the difference in rates would have to be taken into account.

A SUBURBAN RESIDENCE,

WITH DOUBLE FRONT.

SUBURBAN residences are among the most agreeable objects connected with the high state of our cultivated society; and form attractive features in the scenery of the vicinity of our large cities. We have every reason to be proud of our abodes of this nature, combining, as they do, all the advantages and conveniences of the city, with the purer air and more picturesque prospect of the country, and evincing a happy union of wealth, comfort and a

love of the beautiful, eminently conducive to amenity of manners.

The taste for such a style of dwelling-house is becoming more and more prevalent; and, as a natural consequence of the superior cultivation and refinement of those, whose circumstances allow of their carrying out their wishes in this direction; and of commanding the services of those, who have a professional taste and knowledge, we see, rapidly springing up, around all our cities,

roomy mansions, which vie with those of any country in beauty and elegance, conjoined with all the real comfort and luxuriance that can be bestowed on their accommodations and arrangements.

The great difference between city houses and suburban dwellings is not so much in style—though, that the latter is an important one, we do not deny—as that, in the former, from the limited space available, concentration is the grand object, whereas in the latter, what we principally aim at is the enjoyment of the free, pure air, and the natural scenery. Hence it is, that in all suburban and country residences, irregularity and extent have been the leading characteristics.

The Italian style of architecture, which is of a mixed character, and has long been applied to domestic purposes, is one, which, from its interesting associations, and its ready adaptation to the requirements of country residences, has long been a favorite, and is generally adopted. It admits of such abundant internal arrangements, and convenient accommodations on every floor, that, for this particular style of house, it is, in our opinion, unsurpassed. In Italian architecture, it has been very justly remarked, that there are no petty ornaments, to detract from the effect of its simplicity and breadth. None of the sky lines are broken by trifling turrets, or meagre pinnacles. The towers are generally plain, sometimes simply embattled, and occasionally surmounted by a watch-tower, or a belvedere.

There are three essential points, which in any design for a suburban or country residence, are of great importance—the portico, the colonnade or verandah, and the chimney-tops. These are all prominent and striking features, and should invariably be taken into consideration.

The porch is an indispensable feature, not only for its utility, but from its affording an excellent subject, whereon to lavish architectural display and orna-

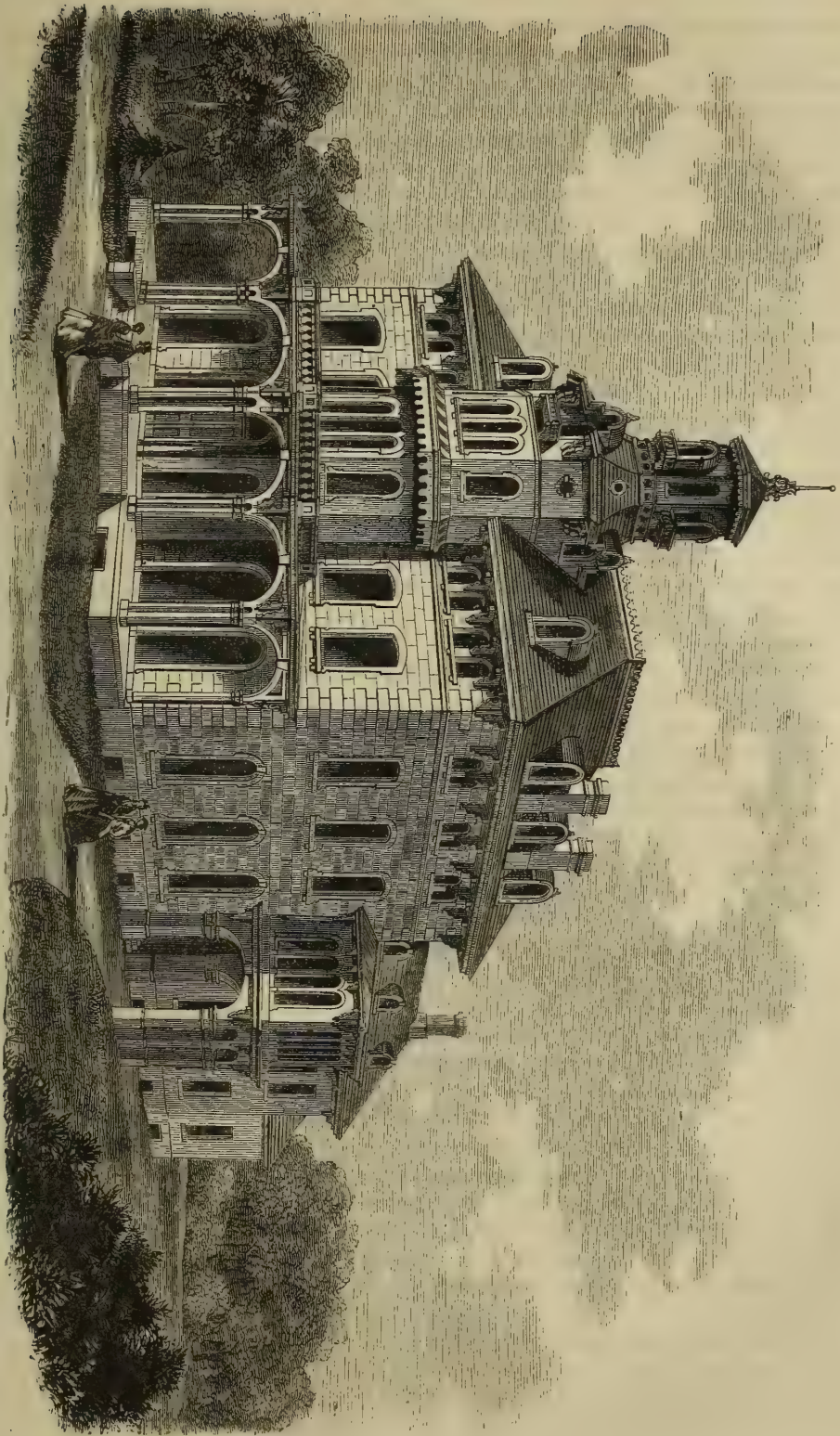
mentation, always, be it remembered, in strict accordance with the general style of the building.

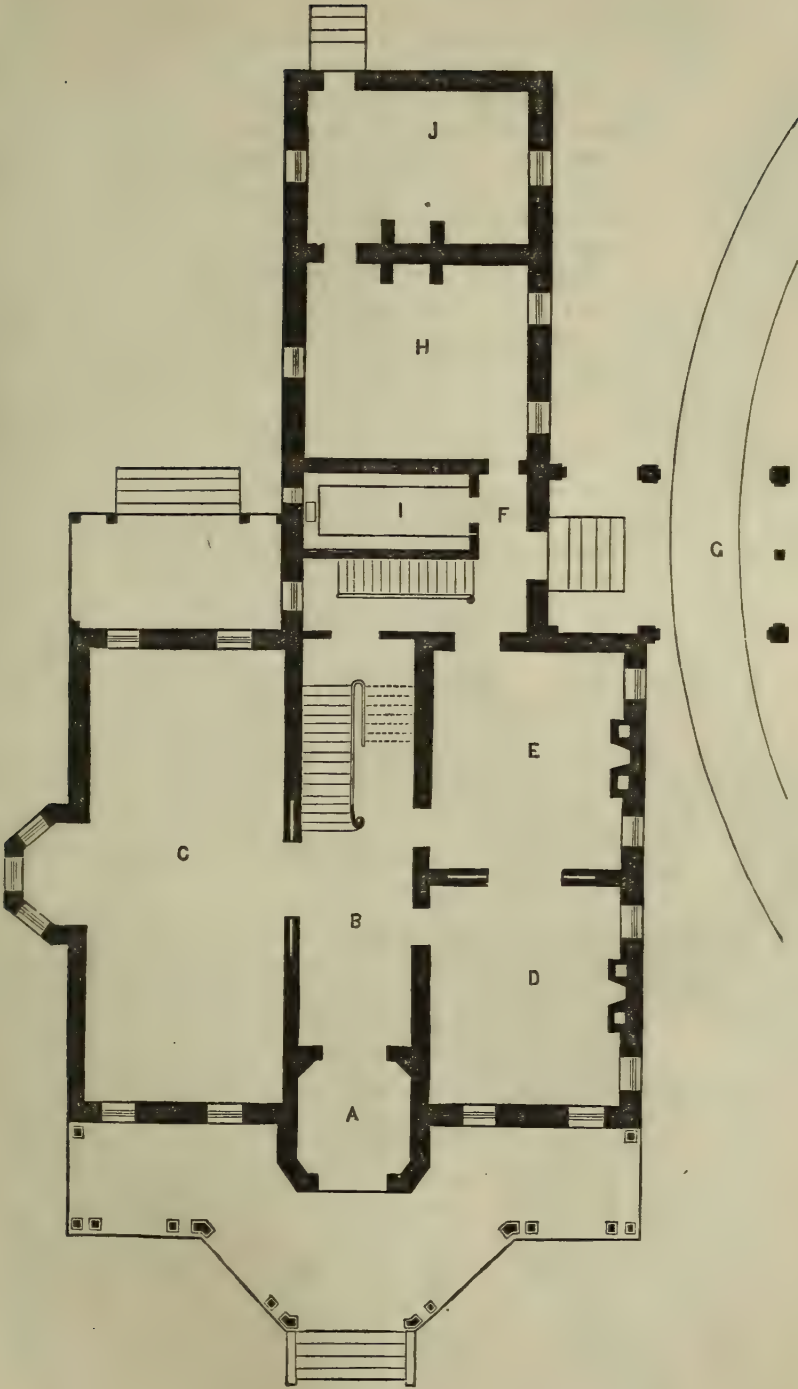
Of the comfort and convenience of verandahs, arcades, &c., it would be almost superfluous here to speak, for, although not an absolute essential, yet they have become an almost universal appendage, in our country and climate, to every dwelling with any rural pretensions whatever. Apart from their utility, as affording shelter and protection from the weather, they are capable of so much decoration and graceful effect, that they should be taken advantage of, even more fully than they are, in designs for such residences. Chimney-tops are a most prominent trait in Italian architecture; and to the skilful use made of them—together with the other characteristic features, campaniles, balconies, open watch-towers, &c.—is attributable the very high favor in which that style is held at the present day.

The subject of this illustration is a SUBURBAN RESIDENCE in the ANGLO-ITALIAN STYLE, which has been erected near Philadelphia. It has a frontage of fifty (50) feet, and a total depth of one hundred (100) feet, including the back-building, which is only two stories in height, whereas the main portion has two stories, together with an attic, and a spacious, well-lighted loft, within the high-pitched roof. The material of which it is constructed is stone, and the covering of the roof, slate of the best quality.

The main entrance is through the tower, which is octagonal, ten (10) feet in diameter; and the lower story of which here forms the vestibule A, of the building. Passing through this, we enter the main hall B, ten (10) feet in width, from which access is had on one side, to the sitting-room D, seventeen feet four inches (17 feet 4 inches) by twenty (20) feet, having two windows to the front, and one on the side. This room communicates, by means of sliding doors, with the dining-room E, of the same dimensions, which also is accessi-

A SUBURBAN RESIDENCE, WITH DOUBLE FRONT.





ble from the hall. On the other side, opposite these two rooms, is the parlor, or drawing-room C, seventeen feet four inches (17 feet 4 inches) by forty-one (41) feet, a beautiful and capacious apartment, having windows to the front, and on the side a large octagonal bay-window ten (10) feet wide, with three lights. Along the whole front of the main building, is a ten (10) feet wide verandah, or piazza, approached by a flight of stone steps. At the back of the drawing-room, also, is a piazza, with steps leading down to the grounds; and access to which is obtained through the two rear windows, which extend to the floor, for the purpose.

Passing on through the hall, past the main stairway to the upper stories, we reach the private stairway to the right of which is the private entrance F, which

forms a very pleasing and striking feature in the design. A stone portico has been here constructed, or, rather, a *Porte-Cocher* G, under which is the carriage-drive, and over which is a large and elegant conservatory. At the back of the private stairs is a door leading into the kitchen H, eighteen (18) feet by twenty (20), supplied and fitted up with range, sink and other modern conveniences, and communicating beyond with a summer-kitchen J, fourteen (14) feet by twenty (20), with a door at the rear. Opening from the hall of the private entrance is the Butler's Pantry I.

The second story of the main building has four large chambers, immediately over the three rooms beneath, and directly over the kitchen, are the sleeping apartments of the domestics.

BAPTIST CHURCH; YORK, ENGLAND.

IT affords us much gratification at being able to present to our readers a design of a Church, which has lately been erected in York, England, for which we are indebted to the kindness and liberality of the Architect, Mr. Wm. Peachey, of Darlington, Yorkshire, who has placed at our disposal this and one or two other designs of churches, constructed by him in different parts of England.

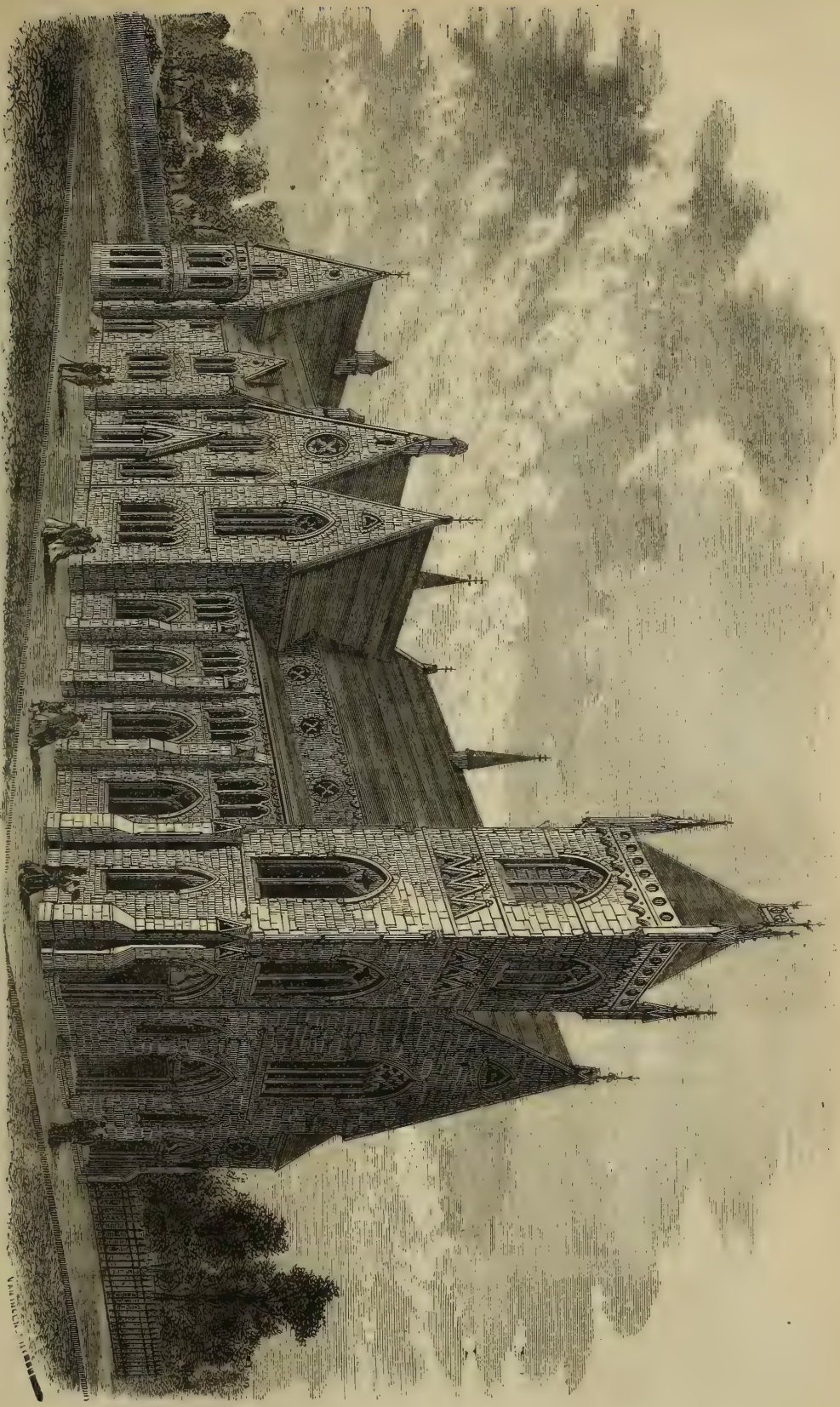
The church is situated with its side to Priory street, Micklegate, and will accommodate about 700 persons.

The style is the Early Decorated. The plan consists of a nave and aisles, with transepts. The extreme length of the nave is seventy-eight (78) feet; the width twenty-four feet six inches (24 feet 6 inches); height to the eaves above the clerestory thirty-two feet six inches (32 feet 6 inches); and to the collar-beam of roof (where it is ceiled) forty-four feet six inches (44 feet 6 inches).

The extreme width is forty-four (44) feet between the aisle walls, and forty-nine feet six inches (49 feet 6 inches) across the transept. The arcade below the clerestory is of brick, with plaster mouldings, and supported upon cast iron columns, with foliated capitals.

A gallery has been erected over the aisles and across the ends, over the vestibules. At the opposite end an arched recess has been provided for the organ and choir. The front of the galleries is of pitch pine, with Quebec pine panels in the lower part, and ornamental iron work in the upper part, the framing being relieved with ornamental chamfering. Small columns are placed at intervals, with brackets above them, to carry the book-board. The iron columns, supporting the arcade, divide the gallery front into bays, as they are seen the entire height.

The organ-gallery front is in ornamental wood-work throughout.



BAPTIST CHURCH: YORK, ENGLAND. WM. PIRCHET, ESQ., ARCHITECT.

A platform has been provided, in lieu of a pulpit, below the floor of which is the baptistery, made in Ransome's patent concrete stone. The steps from the baptistery lead direct into the vestries, without descending from the platform to the floor of the church. The platform has a segmental front, and the rail is supported upon ornamental iron standards. The seats are all open benches, with pitch ornamental heads.

Behind the church, with its end to the street, is a lecture-room, forty (40) feet by twenty-one (21) feet, minister's vestry, lobby and staircase to school-room, which is forty-five (45) feet by twenty-five (25) feet. There are three entrance doorways in the end of the church, the two side ones for the ground floors, and the centre one for the galleries, having a staircase to the right and left hand four feet six inches (4 feet 6 inches) wide in stone.

The three vestibules are divided; but have a door of communication. The timber work of the roof of both church and school is exposed to view. The roof of the church has carved ribs below the collar-beam, terminating upon ornamental stone corbels in the spandrel of the arcade.

The exterior is faced with stone; the dressings in Whitby stone, and the wallings of Bradford, set in thin beds.

The side, being to the street, is the principal front.

There is a tower at the entrance corner towards Micklegate, containing one of the staircases to galleries, with buttresses at right angles, finished with plain canopy. Above these are red sandstone columns in three heights, with foliated capitals; and between is a two-light plate tracery window. Above this there are two moulded strings, with four trefoil recesses, having plain canopies. The top stage is a two-light traceried opening, filled with ornamental slate louvres, above which there is an ornamental corbel course and parapet; and canopied pinnacles, with crockets, are

sprung out at the angles below the corbel-course, upon foliated brackets.

The tower is to the top of the parapet fifty-four (54) feet, and to the top of the pinnacles, sixty-one (61) feet in height. It is covered with a high-pitched roof of ornamental slating, having iron cresting on the ridge.

At the opposite end of the front are two gables, the one being the school, and the smaller one the transept of the church. The former has a porch in the centre, with a two-light window upon each side. Above these is a three-light window, having trefoil heads, with a single trefoil-headed window upon each side, while above this is an ornamental circular window. The transepts have a four-light trefoil-headed window in the bottom part, with a three-light traceried window to light the gallery. The aisle windows are in two tiers, divided by moulded string; the lower tier has two-light tracery windows, and the upper tier narrow, three-light, trefoil-headed windows, the centre opening of each being a little higher than the sides. Above these is an ornamental corbel-course supporting the spouting. Between the two aisle windows are three canopied buttresses in two stages.

The clerestory is lighted by four very ornamental circular windows, an ornate corbel-course carrying the spouting above these; and the roofs are slated in bands of two colors.

The end elevation consists of three deeply-moulded doorways, having trefoil heads, and stone tympanum, with ornamental piercings. The one doorway is in the tower, the elevation of which is the same as the side. Above the doorway at the opposite side, there is an ornamental rose-window, lighting the upper part of the gallery stairs, which is covered in with a high-pitched roof. Upon each side of the central doorway, which is wider than the others, there is a single-light trefoil-headed window; and above the door a three-light traceried window of elaborate design.

The several contractors for the work were: Stone-masonry and brick-laying, Messrs. C. Bowman & Co.; plastering, Mr. M. Croft; slating, Mr. T. F. Wood; carpentry and joinery, Mr. W. Bellerby; plumbing and glazing, Mr. J. Dickinson; gasfitting, Mr. J. W. Dovey, Manchester; painting, Mr. Poulter; smithing and iron-work, Mr. Bonsfield; and warming, Messrs. J. Longbottom & Co.

The contract cost, including every thing, but church and school fittings, was £3,538; and the total cost, including the land, about £5,000. Of this about £1,700 remained unpaid before the opening of the church. This does not include the cost of the organ (nearly £200) which has been defrayed by the proceeds of the fancy bazaar lately held for the purpose.

For the above very interesting and full description, we are indebted to Mr. Peachey, the Architect, who has responded in a most kindly and cordial manner to a request made by us to contribute towards our serial.

In order to give our readers examples of the different styles of buildings, as now being erected in the Old Country, many of which are never heard of by us here, although, like the subject of our present sketch, most deserving and worthy of being brought prominently before the notice of the profession, both for elegance and beauty and purity of style, we have lately placed ourselves in epistolary communication with several gentlemen in Europe, who have, so far as heard from, expressed themselves in a most friendly and liberal manner; and have both given and promised their support.

We have much pleasure in making public the following letter from Mr. Peachey, the Architect of the above-mentioned church, as we feel confident, that our professional brethren, in this country, will afford a cordial and warm greeting to one who evinces so true and laudable a love for the profession, as to

eagerly embrace every and any opportunity of lending a helping hand towards any endeavor to advance the Art. We cannot but entertain a hope, that the example so promptly and so cheerfully set by our English brother-architect may stimulate those among us, who have not as yet made any response to our appeal for assistance, to come forward, and render whatever service may be in their power, towards establishing a National Magazine, worthy of our country and of our profession, that may compare favorably with similar publications in other lands. The following is the communication referred to, from Mr Peachey:

DARLINGTON, ENGLAND,

November 4, 1868.

TO SAMUEL SLOAN, ESQ.,

ARCHITECT,

PHILADELPHIA:

DEAR SIR:

I have been very busy, or should have answered your kind letter earlier. I am glad to hear you have started a journal of the character you name. I have often thought about the matter, *i. e.*, whether you had a "Builder" in America. You know that all genuine Englishmen like to know what you are doing, and are interested in every advance made by your go-a-head country; and there is nothing I should like better, as an individual, than to see for myself; not to remain however, for I like Old England well.

As to *our* profession, I presume you are, like myself, heart and soul, in the cause; and if I can, at any time, render you a service in your work, it will give me very great pleasure to do so.

I send you a photograph of York Church; the part over which I have gummed a slip of paper (to the extreme *left*) is not yet built, the minister's house. I have just squared up all the accounts; and find that the total cost, including church furniture, school-fittings and *every thing* except land, is £3,879 15s. 7d., so it is a remarkably cheap building. I

worked it out with great care, because so much had been said about the failure of Gothic buildings for congregational worship; and I was sure it was not in the mere style. I am happy to say, that my labors have been crowned with the most complete success. The building has been pronounced *perfect* in its acoustic properties by speakers and hearers; and the most bitter opponents of Gothic say, they will "give in," as they cannot find any fault; for while it is sufficiently ecclesiastical to produce the effect on the mind, which the mere entrance into a place of worship *ought* to produce, it has not sufficient to awe the mind, so as to hinder *social* worship.

You must not think me egotistical in the matter, I only wish to give you as correct an account of the building as an interested person can. I send you a description cut from the newspaper,

published at the time of the opening, which is, on the whole, very correct.

I have also inclosed a photograph of a church here, at Darlington. The portion to the right of the tower only is at present built. I will send you a written description hereafter, for I have not a printed one.

Wishing you great success in your journal, I am,

Yours, truly,

WM. PEACHEY,

Architect.

We regret that the ground plan for this church did not reach us in time for insertion in this number; but we will embrace an early opportunity of laying it before our readers, in order the more thoroughly to elucidate the foregoing very full description.

RURAL SCHOOL-HOUSES.

THE subject of suitable buildings for the education of our youth is one of such vital importance. that we consider there is not one more deserving of being brought prominently forward in a magazine of this nature; and—as we are fully aware that a very wide difference of opinion exists among all those, who have made this particular branch of the profession their study, as well as all others, who are in any way, either from professional or purely philanthropic motives, interested therein—we should be glad to receive any suggestions, or any contributions which our readers may feel disposed to forward on this important subject.

It is a remarkable fact—the truth of which cannot be disputed, and which does not reflect creditably upon a community like ours, which abounds with all the facilities of communication, wealth, enterprise, and intelligence that has no rival—that the subject of the improvement

of our school-houses has been allowed to be neglected, and, in fact, almost ignored, in many of our rural districts, so that instead of the school-houses being rendered attractive and inviting to the growing youth, it is too often the case that they have neither comfort nor aught else to arrest the minds of the youth. Yet we see marked and striking changes in the architecture of our other public and private buildings. National pride and love of comfort were doubtless the leading principles, which produced this stimulus to the art

But we cannot understand how we have been so short-sighted in our generation, as to have overlooked, so long as we have done, the wretched and disgraceful condition of our school-houses. True, there has been a rustling among the dry bones. Public attention has become, at last, to some extent aroused; and the result of the painful, though necessary inquiries, which were made

by the different committees of examination into the state of schools in the New England and Middle States, bringing to light, as they did, an almost incredible condition of things, has led to the inauguration of a new system in the era of School Architecture. We have now edifices, which, though not by any means models of architectural beauty, with but few pretensions to any style at all, and far from being perfect in their internal arrangement—the most important of all considerations—still evince such a decided and praiseworthy advance in the proper direction, the true principles, by which we should be guided, being evidently understood, though not perhaps as yet fully acted up to, that we have every reason to feel sanguine, as information and study on these are diffused and enlarged, the more rapidly and widely will improvement extend. In a future number, we intend treating on the Public School Edifices of Philadelphia, many of which, indeed, we may say, the majority of which, are of very recent construction, and claim to be designed on, and possessed of, all the latest improvements and principles, the fruits of careful and patient research and inquiry.

Much care and attention have been bestowed upon the internal arrangement and conveniences, and, above all, on the proper ventilation of the buildings, a point heretofore totally disregarded, as many of us can testify, from our school-day experience. We may be perhaps allowed to say, that in many of the more recent school edifices constructed in this city, more attention seems to have been paid to the last mentioned features, than to the external appearance of the buildings. Although this may by some be considered as a very secondary consideration, and not to be balanced against the former advantages, still we are of opinion, that it is not a matter of such little importance, as it is deemed by some, to render the exterior of our school-houses as pleasing

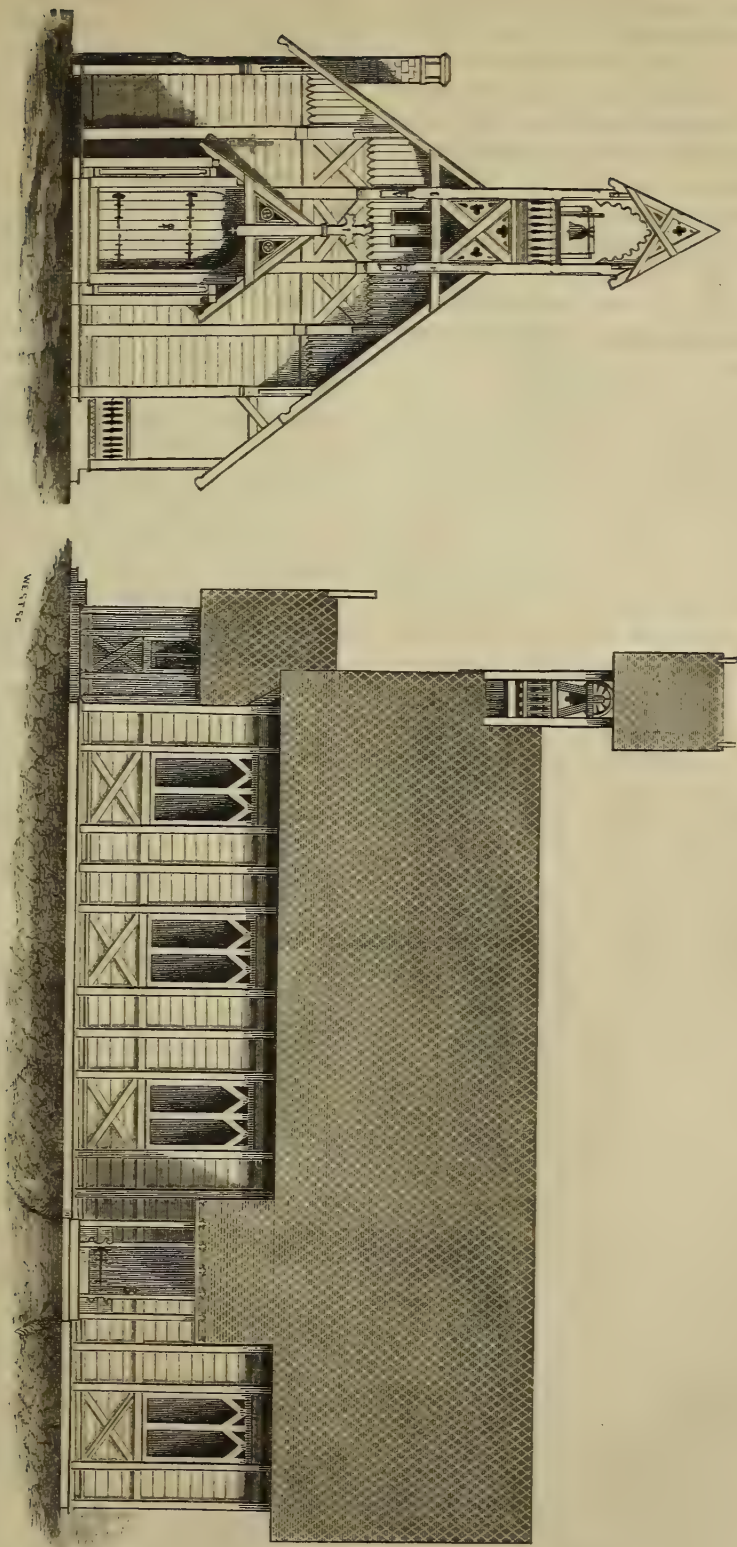
and as attractive to the youthful mind as the science of architecture, restrained of course by pecuniary considerations, can make it.

Instead of allowing a repulsive appearance, or one ill-calculated to attract or to leave a pleasurable impression on the memory in after years, we should endeavor to give our school edifices as much architectural effect as possible, by a display of taste and effective ornamentation. However, we will return at some future time to the subject of City School-houses—for the present we will confine ourselves to a few remarks on Country School-houses.

We have here presented to our readers a Front and Side Elevation and Ground-plan of a Design for a RURAL SCHOOL EDIFICE. The style partakes, in its general leading characteristics of the Swiss; and, from its very nature and materials, is well adapted for a rural community, where it would conform to the general requirements and surroundings.

It is not necessary for us to recall to our recollection the country schools of our earlier years. Even yet some may be met with; but we are glad to be able to say, that the spread of enlightenment has swept away most of the old and semi-barbarous notions; and has called into existence buildings, which, though not perfect, still are a step in the right direction.

First: as to the site of a Country School-house. It should not be located on the principal road, where there is much thoroughfare likely to distract the attention of the scholars from their studies, but should be built in some quiet, retired, and at the same time, respectable neighborhood; and upon a well-selected and healthy piece of ground. This should be an object of the very first importance. It should always be enclosed with as large a yard, as is attainable, so as to have a capacious playground; and, wherever practicable, a portion of the latter should contain a few shade trees.



ELEVATIONS OF THE RURAL SCHOOL-HOUSE



The building of which we have given a design is, as will be seen, intended to be constructed of timber. It is twenty-one (21) feet high, having one main entrance through a porch, and one on the side. It has a frontage of twenty-eight (28) feet by sixty (60) feet in depth, including the front porch.

The school-room itself—there being only one compartment, which could be easily divided off, if necessary—is fifty (50) feet long by nineteen and a-half ($19\frac{1}{2}$) feet broad; and is capable of being fitted up with desks in the manner shown on the ground-plan.

It may be useful here to give the different sizes of the desks in use in school-houses, premising that they all face in one direction. What are called grammar-desks are the largest, being forty-two (42) inches long, thirty-two (32) inches broad, back to the back of the one in front. Secondary desks are forty

(40) inches long and twenty-seven and a-half ($27\frac{1}{2}$) inches from back to back; and primary desks thirty-eight (38) inches in length, and twenty-four (24) inches from back to back.

Passages have been left, twenty-two inches wide between each row of desks. Of course, this arrangement of seats has only been given to show what could be done; but the final arrangement would depend entirely on the number of pupils and the judgment of the local authorities.

Too much care cannot be paid to the comfort of both teachers and scholars; and every thing that can be done, should be carried out, in order to render the school-house a pleasant and desirable resort; and not one to be shunned and dreaded, as only a necessary evil, which must be undergone, and one which it is not desirable to mitigate by any attractive and healthful associations.

NOTE.—We have said above, that the design for the school-house in question is, generally speaking, Swiss, or, better, Swiss Gothic; but the angles of the roof, the porch, and the belfry are those of the Gothic. The diagonal timber-framing belongs equally to either. Structures framed on this general principle, are also common in Denmark, Sweden, and, more particularly, Norway. A glimpse of the general effect, from the force of association, has an inevitable tendency to recall the timber-framed houses of England, in the olden time; although, in their case, the timbers were only the skeleton of the house, as to wood-work; the sides themselves being constructed of bricks, filled in between, leaving the wood exposed, flush with the brick-work, and forming a quaint kind of diagonal latticing. Yet, originally, this style belonged to Holland; and was, indeed, by the English, imported thence, in many cases, bricks and all.

CHEAP COTTAGE DWELLINGS.

MATERIAL is the first consideration in the construction of any building, and in none is it of more importance, than in the dwellings for that class, whose means will not permit them to choose what they would most like. There is to be found a suitable material in every location—no matter where—in which a man's destiny may be cast. The "bush" affords *wood*; the neighborhood of a quarry presents *stone*; the soil of clay and sand gives *brick*, burned or unburned; and even in the absence of all these, the *lime and gravel* may be found, which will afford still another material to man, in the form of *concrete*.

The cottages we present to our readers can be constructed in each or any of these; and in all, if proper care be observed, with great advantage to the economic comfort of the *habitant*.

Without regard to the apparently trifling requirements of proper execution, a house—no matter of what material—loses much of its value in strength, durability, or capability of affording the most desirable shelter for its inmates. How necessary then, that every care should be taken to render it as perfect, as the case will admit of; and how much is the interest of the owner concerned in seeing such things, so vital to his interest, duly attended to. A little care taken in the formation of a joint would prevent the intrusion of cold, or wet; and save, if not the doctor's bill for fighting the rheumatism, at least the cost and trouble of an unsightly patch.

As the manipulation of stone or burnt brick is so well understood, there seems to be no necessity for treating of the construction of walls in them. We will, therefore, take up—

THE ADOBE, OR SUN-DRIED BRICK.

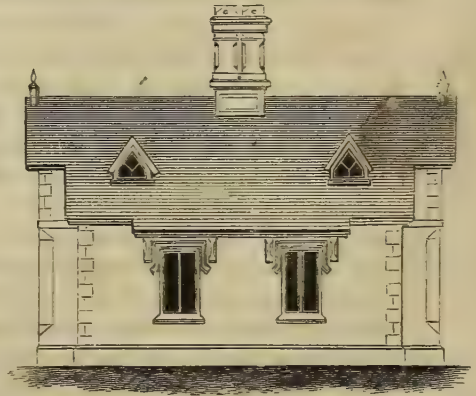
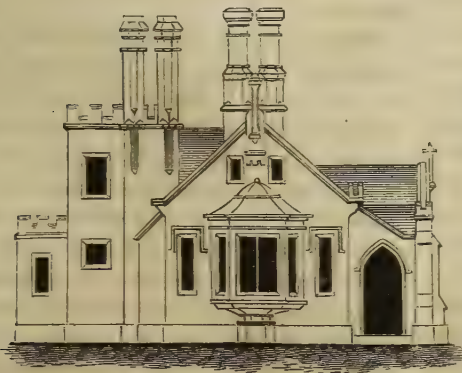
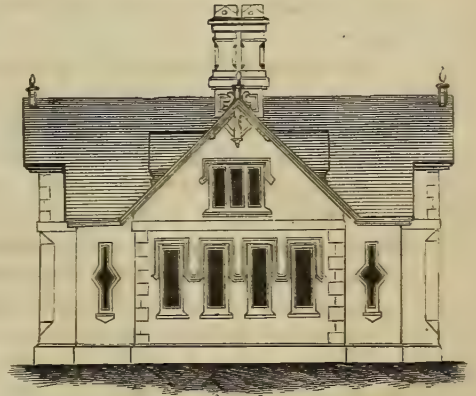
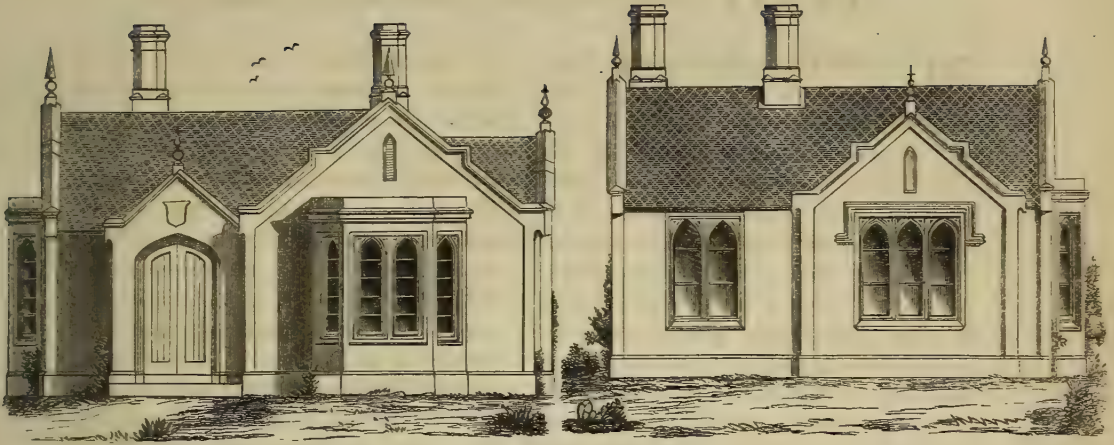
This material is very generally used,

throughout Mexico and Peru; and is often to be found in our Northern latitudes. In Canada it was popular, a quarter of a century ago; and some specimens were then to be found in the United States. When carefully formed, and a due admixture of the most fitting material faithfully made, the *adobe* (pronounced, a-do'-be) is a substantial and very economical material, and well worthy of attention. It is true, it has its drawbacks, one of the chief of which, is the shrinkage it undergoes in drying. Hence the necessity for making full allowance for such shrinkage in the construction of the walls. But, that *adobe* is as sound as well as cheap material is as certain, as that it was used before the baking or burning of bricks was put in practice. The Bible records the use of such sun-dried bricks; and no doubt they were highly thought of, in those days, as the most extensive public works were constructed of them.

Climate, of course, has much to say in the matter; and the induration of the bricks is dependent greatly on the thorough drying, or sun-baking, they receive.

The mode of manufacturing *adobes* is as follows:

Make several boxes, the more the better, of seasoned stuff, planed smooth on the inside. The sides should be twenty inches long, and the ends twelve inches; or, the intended thickness of the walls. On the inner face of the sides of these boxes there should be two grooves, into which the ends can slide, and the sides can be held together by rods running through them, and fastened on the outside, so that the box can be made perfectly tight. These boxes should be at least six inches deep, and without a bottom. The sides should project sufficiently beyond the ends to admit,



CHEAP COTTAGE BUILDINGS.

not only of fasteners, but of handles by which these moulding boxes may be worked with facility. Boards, smoothed on the upper side, should be laid upon sleepers on the ground, and set far enough apart, to admit of a passage between them. These boards should be not less than an inch and a half thick, to prevent "buckling." They should be lightly strewed with sand, so that the material may not adhere to them.

The moulding boxes and drying boards being now ready, we will speak of the material. The clay should be very aluminous, in order to have it plastic; but it should not be too rich. To obviate such a state, it is only necessary to add sand. Some mix in an inferior earth, but sand is decidedly better; and if, in wetting, a bushel of lime be added to every thirty gallons of water, it will add materially to the strength of the brick. The clay being ploughed up, and the surface sods taken off, oxen, or horses, should be turned in, and made to trample and work up the whole; it being sufficiently saturated from time to time with the lime-water. Straw, rushes, or any convenient binding material is now to be cut into lengths of, say ten inches, and thickly strewed over the muck or material, and then thoroughly worked or trodden in, by the animals. When the composition is fairly mixed, so that it is ready for the moulds, the boxes, already described, are to be filled to overflowing with the material, and well rammed down, with square rammers, as compactly as possible. They are filled up flush again, then rammed; and so on—until the top of the box is reached. They are then to have their surfaces evened off by wooden scrapers, moved firmly along the top of each box, and the surplus thrown back into the working bed. In a short time, these newly moulded bricks will be shrunk sufficiently to permit the boxes being removed, which is done by carefully raising them up. And here it would be well

to suggest the previous wetting and sanding of the insides of the boxes, so as to admit of their being easily removed.

The new bricks may now be left to dry, and bake in the sun, for not less than four days; care being taken to protect them from occasional showers of rain. This may be effected by means of a portable shed, which might be in the form of a light frame, covered with tarred paper, kept in rolls, ready for use.

The moulding boxes may now be refilled, on other boards, and the same course pursued as before; and so on, until all the required bricks are moulded. Each brick being sixteen inches long, and six inches thick, it is very easy to calculate the number wanted to build any given amount of work.

The baking process being now complete on one side, the bricks are to be carefully turned over, and left to the finishing strokes of the sun.

The foundation walls of the cottages should be of stone, or well-burnt brick, but better of the former: the whole set on a footing-course of concrete, six inches thick. These foundations should be carried up above ground, say eighteen inches, and be covered with cement, to prevent damp rising into the walls.

The whole being leveled off, the superstructure may be commenced, and the *adobes*, or sun-dried bricks, laid in regular courses, carrying out the plans and elevations here given. The joints may be of ordinary mortar. They should be carefully pointed, if the front is to be simply white-washed; but, if the intention be to rough-coat them with gravel and lime, and plaster or rough cast, it would be well to leave the joints rough, filling them with the coating material.

The rough-cast may have some sienna, dissolved with glue or size, in hot water, thus giving it a tint. There are many other tints which can be given, but of these, and their proportions, we propose to speak on some other occasion.

The chimneys may be built of the *adobes*, although ordinary burnt brick is superior for the flues.

It would be judicious to insert rough temporary frames in all the openings for windows and doors, until the brick is perfectly hard, and settled to its place.

We have seen bad consequences arise from a contrary practice, and much unfair criticism founded on this very point.

The interior faces of the walls should be plastered three coats, and hard-finished for painting.

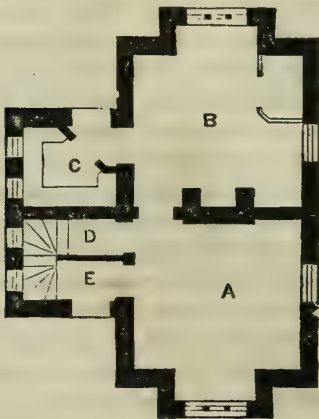
All sills and lintels should be of stone, and carefully laid.

We must say, we like this material much. It makes a warm house in winter, and a cool one in summer; and is, in most respects, very desirable; economy being its leading end, and, to millions, its most desirable characteristic.

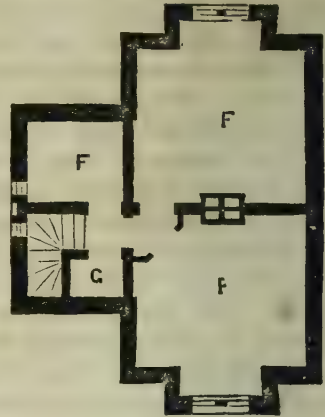
The finish of these cottage dwellings will be in perfect keeping with their peculiarities of style; and, as such constructions are in themselves ornamental, they do not call for embellishment.

Our first illustration is a large cottage, of which the ground-plan may be thus described:

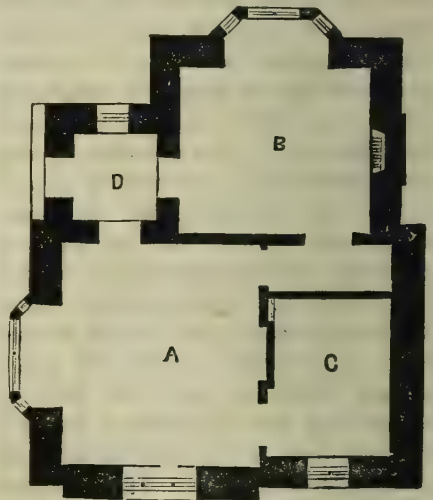
A, the Parlor; B, the Kitchen; C, the Pantry; D, Closet under the stairs, and E, the Entrance Hall.



In the second story, F F F are Bed-rooms, and G, a Closet.



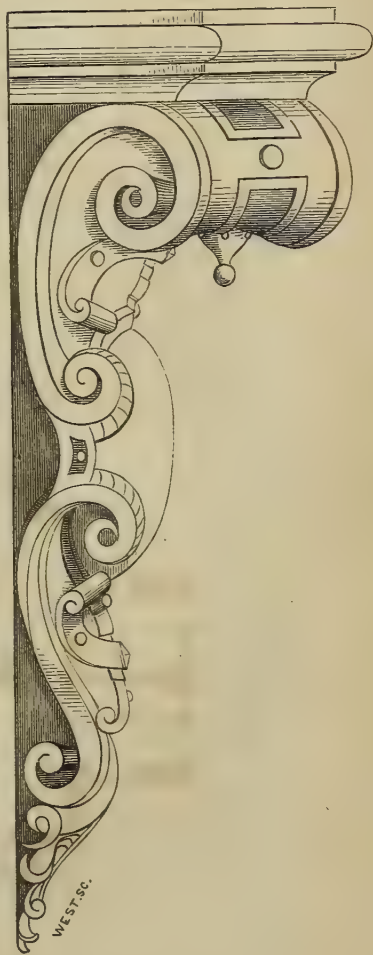
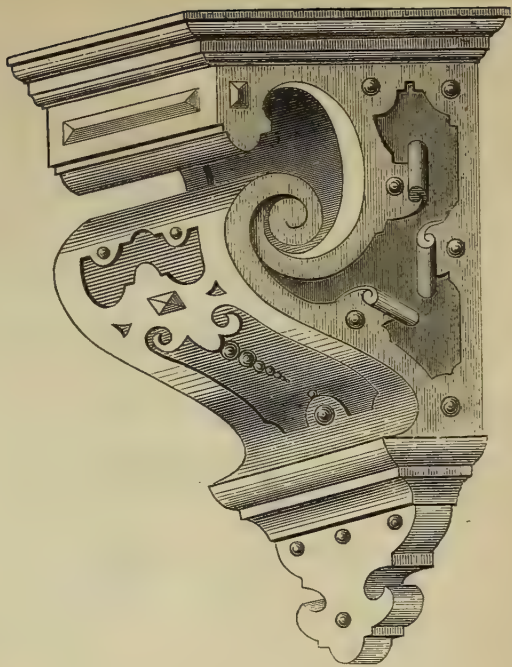
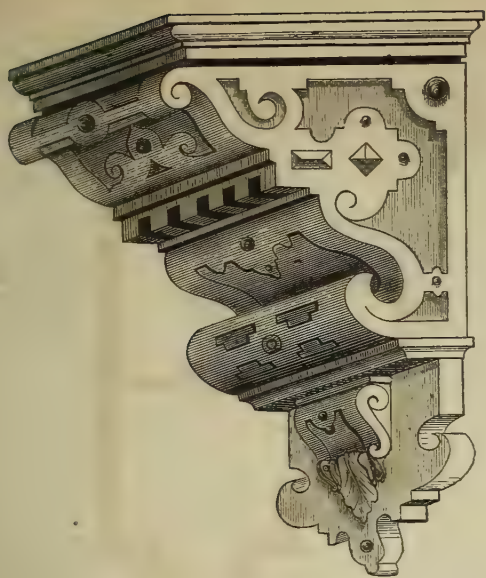
The next design is for a less expensive cottage, the plans of which are as shown here:



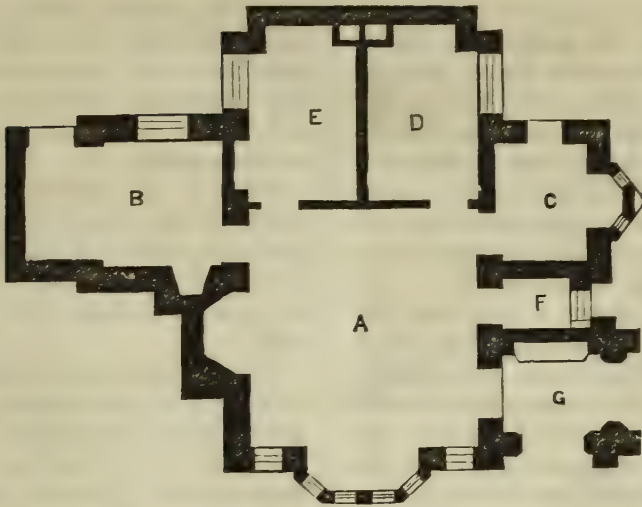
A, a parlor, with Bay-window; B, the Living-room, with Bay-window; C, Bed-room, off parlor; D, the Porch.

This latter is a comfortable cottage for a lone couple, and, by a slight addition, might be made to accommodate a small family.

We here present another one-story cottage: A, Living-room; B, Kitchen; C, D and E, Bed-rooms; F, Pantry, and G, Porch.







These designs can be executed in wood, stone, brick, or concrete, as well as in *adobe*, and can be made to look tasteful and neat. If executed in wood,

there are several ways of building them, and many befitting styles of ornament, which we propose to take up, on other occasions, *seriatim*.

PRACTICAL CARPENTRY & JOINERY

BRACKETS OR CONSOLES.

THESE are among the necessary ornaments of architecture. They are used for supports to a cornice, an arch, a table, &c., and, in our American Domestic Styles, form a prominent and very interesting feature in the finish of fronts.

The accompanying plate presents four examples. They are all Elizabethan. Both the lower ones are the same design, the one being a front, and the other an angular or side, view.

The word *console* is much used; and we derive it from the French architects; but this name is singularly infelicitous. If we trace it to a Latin origin, we find it still more puzzling. The term *bracket* more clearly conveys the meaning, or

use, of this ornament; *console* having reference to the foot, and *bracket* meaning the arm. Both are French words, derived from the Latin; and, as both are used in the upper part of a building, it is evident that *bracket* is the more fitting word. The term *corbel* is sometimes used, instead of either of these; but very incorrectly. The true meaning of *corbel* is a hanging, not a sustaining ornament. It is likewise derived from the French, meaning a basket, and should not therefore be used in the sense of a support.

We are thus particular, in reviewing and inspecting this matter, as some of our builders are too apt to mix up those features; and, as errors are more sure to

thrive than facts, we deem it our duty to draw the attention of our readers to this subject. We would add, that the term *truss* is no more correct, when applied to the work of the *bracket*, than are the others. A *truss* has reference to a heavy framing; and should not be confounded with a light support. *Ancone* is still another name for this object; but it is little known and less used; so we will not waste time on it.

BRACKETS answer a very good purpose, both inside and outside of a house; and have, of late years, grown greatly into favor, in the composition of country houses. In fact they have been made the feature, in so much, that our English critics denominate a composition in which they are much used, "American bracketed Architecture." We find no fault with this; but we do denounce the excess to which some builders carry the

use of this otherwise pleasing and certainly very useful feature. We have seen roofs of two story buildings project fully three feet. Thus giving a very bad effect to the whole house. Even at five stories such over-hanging eaves would be faulty.

Brackets are capable of receiving much embellishment; but it must be of that order, which will not lead the mind to suppose, that any part of their duty is to support their own ornamentation.

Grace of curvature is the chief object to be kept in view, in their outline or general shape. And there are few things that call forth the artistic taste of a designer more than this very bracket. Nature's exquisite curvatures of long foliage, meeting with obstruction, will present charming hints for the free pencil, guided by judgment and skill.

CENTERING.

NOTHING in the scientific range of Carpentry demands more attention, than the problem of CENTERING; or the construction of a framing, on which arches of stone, or brick, are to be turned. When we consider the weight to be borne, the pressure to be resisted, and the imperative necessity for accuracy of curve, it will be at once seen, that it is by no means a trifling matter.

The most eminent engineers and architects have made this subject their study. Nor is it alone in large constructions, such as aqueducts and bridges, that it is to be pondered, and wrought out; but in the smallest arch its peculiar characteristics are to be seen and attended to. Every round-headed opening in a building has to be turned on a centering, so that much depends upon its strength and accuracy. There must not be a possibility of the slightest

change of form. The centres must be easy of removal, and as economic, as is consistent with the requisite strength.

The following problems will be found useful in relation to centering:—

To form a true Ellipsis, on a given Base, with a given Height.

FIG. 1. Let A B be the given line; D C the given height: Take off from B to D equal to this height, D C; divide the remaining portion, towards D, into three equal parts; give one of these parts to lengthen the distance from D to B; call this new point F. Now take the distance from D to F and mark it off on C. Next take C and F, as centres respectively, and the distance between them as radii, and describe arcs crossing each other at H. Join H F, and H C, and continue the lines to I and G respectively. Lastly: Taking H as a centre, describe the segment I C G; and, taking

FIG. 2

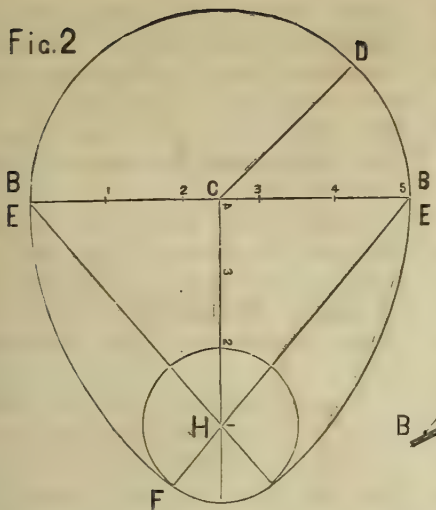


FIG. 1

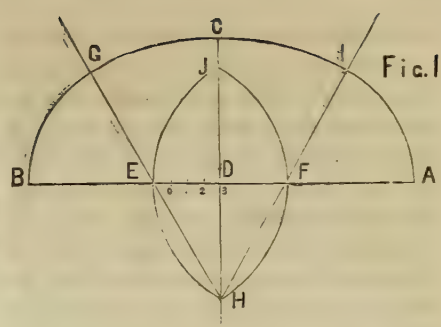


FIG. 3

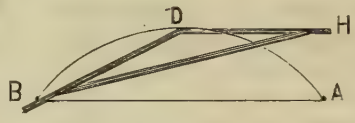


FIG. 4

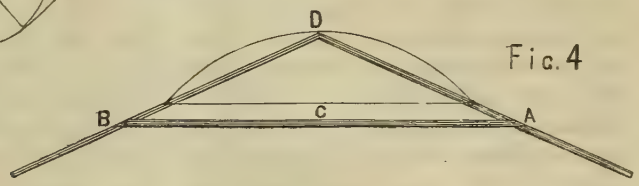


FIG. 6

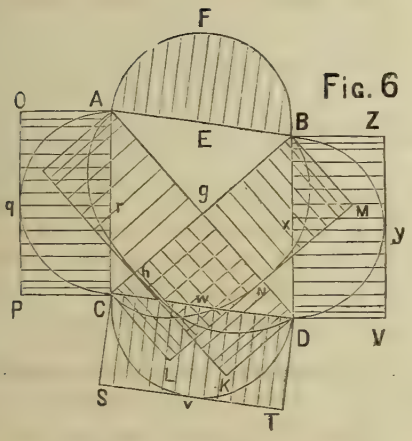


FIG. 5

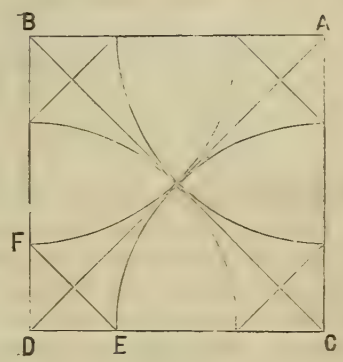


FIG. 8

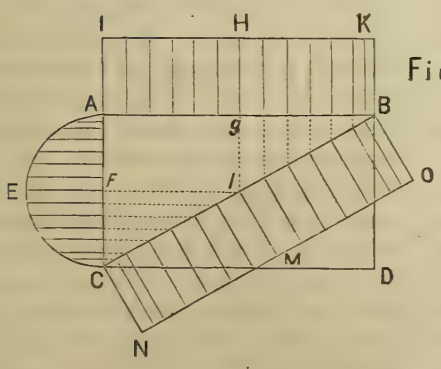
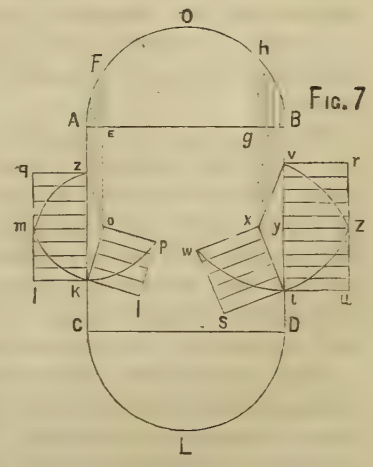


FIG. 7



C and F, respectively, for centres, with C I, and F G, respectively, for radii, describe the arcs A I, and B G; thus completing the ellipsis.

Having the Chord, to construct the Centering for an Egg-shaped Culvert.

FIG. 2. Take the chord A B, and dividing it into two equal parts, strike a semi-circle from the centre. On the chord, as a base, construct a reversed equilateral triangle A H B, the apex of which will be the centre of the circle H, the radius of which is one-third of a line H C drawn from this centre to the former. Prolong the respective sides of the equilateral triangle; and taking A, B, alternately, as centres, and the length of the chord as radii, describe the two arcs; and thus unite the circle with the semi-circle, and complete the figure.

Another Method:—With half the length of the chord A B as a radius, D C, describe a semi-circle A D B; and with the whole chord A B as a radius, describe an arc A F; and with B A for a radius, describe an arc B I. On the chord A B construct a reversed equilateral triangle A H B; produce the sides A H and B H to F and I respectively. Then, taking H F as a radius, connect the arcs A F and B I by the small arc F I.

A Third Method:—Divide the chord A B into five equal parts. Apply four of these parts to the line D H; one of these parts will be the radius H F. The semi-circle segments and small circle will be all struck as before.

FIG. 3.—*Having the Chord and Height of the Segment of a Circle, to describe the Segment without finding the Centre.*

Join D B, and draw D H parallel to B A. Apply the trammel, so that its angle may coincide with that of the figure; previously putting pins at the points A and B, and sliding the trammel along them. A pencil at D will describe half the arc; and by moving the pin out of B and putting it in A the

other half will be described in the same manner.

FIG. 4. *Another method:*—Let A B be the chord of the segment, and C D its height. Join D A and D B; stick a pin at A and another at B. Now take a trammel and fix a pencil point at its apex and apply it on D; slide the trammel along the pins A and B, keeping the sides close up to the pins, and the pencil point will correctly mark out the required segment. The trammel above mentioned is thus formed: Put together two slips of wood, so as to form an angle equal to A D B, each of the sides prolonged to the length of the chord A B; secure this angle by a cross-piece, and the trammel is complete. It is formed so that the segment of a circle will be equal to that of Fig. 3 or 4; and is made practical when the circle is of great diameter. Either of these tram- mels may be applied in flat segments; but the latter, by reason of the obtuse- ness of the angle, slides with less fric- tion along the pins, takes up much less room, and can be applied in all cases, whereas in many it is impossible to use the other. If the height of the arch is very small, the instrument may be in one piece.

To describe an Octagon within a Square.

FIG. 5. Draw the diagonal A D in the given square; and taking one-half of it for a radius, with A for a centre, describe a segment. Do the same at the other three centres, B C and D; cut off the angles of the square by joining the points; and the octagon is complete.

Having one Centre given for an Unequal-sided Groin, to form the Other, so that the Intersection thereof shall produce the Angle, or Mitre-Arch, to hang perpendicularly over its Base, and, moreover, to draw the Centre thereof.

FIG. 6. Draw the lines A B and B D, and D C and C A, each equal to one another, to represent the walls from

whence the arches spring, and on the line *A B* describe the given arch *A F B*. This being done, divide the line *A B* into any number of equal parts, from whence raise perpendiculars to *A B*, to touch the arch *A F B*, and draw the diagonal lines *A D* and *B C*. Then take the line *E F*, and set it perpendicular to the lines *A C*, *A D*, *C D*, *C B*, *B D*, from *A* to *O*, from *A* to *I*, from *C* to *P*, from *C* to *S*, from *C* to *L*, and from *D* to *K*, from *D* to *T*, from *D* to *V*, and from *B* to *M*, and from *B* to *Z*, and draw the straight lines *O P*, *I K*, *S T*, *L M*, and *V Z*. Now divide the base lines *B D*, *D C*, *C A*, *A D*, and *B C*, each into the same number of equal parts as *A B* is divided into, and from the points of division draw parallel lines to touch the lines *O P*, *S T*, *V Z*, *L M*, and *I K*. Then take the lengths of the perpendiculars to *A B*, drawn to touch the given arch *A F B*, and set them off in the correspondent parallels drawn from the points of division of the several bases upwards, and the arches will be described.

The Arch Line of a large Ceiling, or Vault, supposed to be semi-circular, being given: how to form the Curve of a Lesser Arch, that shall intersect the Side thereof, to give way for Doors or Windows, so that their intersection shall produce the Groin to hang perpendicularly over its Base; as also to form the Curve Line thereof.

FIG. 7. First, draw the lines *A B*, *B D*, *D C*, and *C A*, to represent the walls from whence the arches spring, and describe the two given semi-circular arches *A O B*, *C L D*, and in the line *B D* set off the span of the intersecting arch from *v* to *t*. Then set off the height you design to raise the lesser arch *v z t* from *g* in the line *A B*, perpendicularly to touch the arch in *h*, and from *v* to *r*, and *t* to *u*, and draw the line *r u*, which halve in the point *z*, and draw the line *z y* parallel to *vr*, or *t u*. Then lay a line from *h* through *h* through *g*, towards *x*; as

also from *z* through *y*, towards *x*; and these two lines will cut one another at *x*, from whence to the points *v* and *t* draw the lines *x v* and *x t*. Now set off *g h* perpendicular to *x t*, from *x w*, and from *t* to *S*, and draw the line *S w*, and divide *q B* into any number of equal parts at pleasure; from the divisions of which, draw perpendiculars to *q B*, to touch the arch *A O B* between the points *B* and *h*, and divide *v y* and *y t*, the halves of the base *v t*, each into the same number of equal parts as *q B*: also, *x t*, and from the point of division draw parallel lines to touch the lines *u r* and *s w*. This being done, take the lengths of the lines that were drawn from the points of division of *g B* perpendicularly to touch the part *B h* of the arch *A O B*, and set them off in the correspondent parallels from *y v* to *z r* and from *y t* to *z u*; as likewise from *x t* to *w s*. As you set off the parallels, stick in nails and bend a thin rule about them, and describe the sought arches; *v z t* is the true intersecting arch, and *w t* the curve line of the corresponding groin.

If the Lesser Arch of an Irregular Groin be a given Semi-circle, it is required to form a Larger One, so that the Intersection of those two Arches shall make the Arch Line of the Angle to hang perpendicular over its Base; also, to draw that Arch Line of the Angle.

FIG. 8. First, draw the lines *A B* and *C D*, to represent the walls from which the arches spring, and draw the line *C B*, and on *A C* describe the semi-circle *A E C*, and divide *A C* into any number of equal parts, from whence draw parallel lines to *C D* to touch or come to the arch *A E C*, and if these parallels are continued out to the line *C B*, they will divide it into the same number of equal parts as *A C* is; and if from each of the divisions of this last line, parallels to *A C* are drawn, they will divide the line *A B* into the same number of equal parts

as A C or C B is divided into. Continue A C to I, so that A I be equal to E f, and continue D B to K, so that K B be likewise equal to E f, or A I, and draw the line I K. At the points C and B raise the perpendiculars C N and B O to C B, each of the same length as E f, or A I, or B K, and draw the line N O.

Lastly, from the divisions of A B, draw parallels to A I; and from the divisions of C B parallels to C N. Then set off the heights or lengths of each of the parallels in the semi-circle A E C, upon the correspondent parallels to A I and C N, and stick in nails. Then bend a lath round the edge.

THE GAZETTE.

HOT-CAST PORCELAIN.

HOT-CAST Porcelain is so new an article comparatively, that, doubtless, our readers will be pleased with a short description of it and its uses.

In chemical composition and general nature it is nearly midway between china, or porcelain proper, and glass; and its uses are very diversified, including artistic figures, vases, brackets, bell-shades, conical lamp-shades, stamped artistic shades, cups, tumblers, goblets, beakers, egg-cups, with eggs (for practical jokes) to match, napkin rings, match-boxes, perfume-bottles, very large evaporating-dishes for photographers, paint-cups and tiles for water-colors, flooring tiles, ashlar for bases, instead of brown-stone or marble, paper-weights, lamp-stands, door-knobs and escutcheons, plates for photographic pictures, table-tops and mantel-pieces, columns, cornices, wash-stands, door and window-frames, slabs and grave-stones, monuments, obscuring window panes (instead of ground glass)—which have the merit of being smooth on both sides, and therefore of not harboring the dust—balustrades and hand-railings, lintels, window-sills, and, in fact, things innumerable.

Hot-Cast Porcelain cools with a handsome semi-vitreous surface lustre; but when the natural surface is ground off, the body of the material takes a fine

polish and its lustre is even improved. The inner surface of the material, as well as the outer glaze of cooling, is impervious to acids, thus specially adapting it for the many utensils required in chemical laboratories.

Most of the demand on the company is for perfectly white ware, but the substance is capable of receiving the most varied colors without material alteration of its varied good qualities. A beautiful opalescent iridescence is sometimes observed on it, from the commingling of fancy colors. In plain tints, tones and hues, we noticed cream, siskin, drab, olive, blue, purple, brown, gray, green; and in fancy markings, striped, variegated, mottled and marbled. We were informed by the attentive assistant, that, the "pot-bottoms," or glass remaining—after being nearly drained in the course of manufacturing, and allowed to cool—often exhibits magnificent color effects, in changeable flushes, waves, &c., which he could only liken to the aurora borealis, as nothing else in nature seemed to vie with this sedimentary glass.

It is claimed that "this new and remarkable ware combines the beauty of French china with the strength of the strongest marble. It is capable of being formed into any shape into which glass can be blown, pressed, moulded

"or drawn. The materials which are employed in its manufacture are inexpensive, and are as easily worked, as those from which ordinary glass is made. Its durability, and resistance to heat, cold, acids, and other destructive agencies, have been thoroughly tested, and with the most satisfactory results."

Early in December, we paid a visit to the extensive works of THE AMERICAN HOT-CAST PORCELAIN COMPANY, at the corner of York and Gaul streets, Richmond, Philadelphia; and safely passed the portentous "No Admittance except on Business," by means of a letter of introduction, from a genial friend, to the superintendent, Waldron J. Cheyney, Esq. He himself was not in at the time; but his gentlemanly assistants made us welcome; and extended every facility in furtherance of our object. Taking a rapid survey of the office, general premises and packing-rooms, we proceeded, almost at once, to the grand apartment of the furnaces, where a busy crew of skilful men and agile boys were manipulating the fiery and plastic material. Perhaps we cannot do better, than describe a few of the processes, although in these—following the methods of manufacturing glass for the same general purposes—there is nothing specially new.

Planned in accordance with the modern best models of arrangement, for buildings of this nature, the place is large and lofty, exceedingly light of construction, and unimpeded by vertical supports, the only interruptions to the general view being the tall conical furnace-stacks.

Passing through a long corridor, from the room containing the finishing side of the annealing furnace, we came first to a gang of men and boys making

PITCHERS.

The particular style occupying them, at the moment, was Molasses Pitchers; but the process is much the same for all kinds. A furnace boy brings the blower his long blow-pipe, with a bit of

red-hot glass, as it is technically called, upon its lower end, of about the size of a small orange, obtained by dipping the tube into the incandescent molten material, at the bottom of the furnace, and giving it a slight twist, as it is raised. The blower takes the pipe, blows in it, to increase the size of the plastic knob; revolves and sways the pipe slowly backward and forward, the glass bladder, or bubble, as it may be termed, gradually elongating and enlarging; and, at a given signal, has an attendant open for him a hinged iron mould, in which he rests the fast-cooling opalescent mass. The mould—containing the proper depressions for making figures in relief upon the side of the pitcher—is instantly closed; and, without revolving his pipe, with one steady puff, he forces the glass into all the recesses of the mould. The mould is immediately opened; and the pipe and pitcher together carried by a boy to the finisher, who rests the pipe upon a slight rail or ledge before him, the pitcher, bottom outwards, being turned away from him. Meanwhile another boy has brought a small mass of melted glass upon the end of an iron rod, and has swayed it, until it drops into a long pendant, at the same time rolling it upon a small level iron table, before him; and, as he hands it to the finisher, twirls his rod, until, from the centrifugal motion, the glass resembles the trunk of an elephant. Upon the handle side of the pitcher were moulded two little knosps or projections, corresponding to the insertions of the top and bottom of the handle. At a motion from the finisher, the youth drops the hot and plastic end of the trunk of glass upon the hot upper projection of the pitcher, where the finisher immediately fastens it, by a momentary pressure of a large pair of plyers held in his right hand. The youth withdraws his rod, to obtain the length of the proposed handle. This drawing causes the rod-end hand of the glass to become the slenderer part; and, the proper length being obtained, the fin-

isher, with a pair of scissors, cuts off the glass, takes the rod in his left hand, revolves the half-attached handle on the pitcher, to lengthen it, and, with his piers, gives the handle somewhat the form of an S, and fastens the lower end down to the lower projection on the pitcher, making it secure by a single pressure of the butt of his piers; and shapes up the handle itself by the blades of the piers. A slight jar of the rod against the edge of a trough then detaches the pitcher, which is at once taken up on a rod, in the hands of a small boy, and borne off to the annealing furnace.

A few steps to the left was a similar gang engaged in moulding

LAMP-STANDS.

The principal operator stands before an upright iron press, arranged with table, plunger, and stops, the whole adjustable by means of set-screws, and provided with an iron mould, in two parts, whereof the lower is hinged, to open and free the glass knob, forming the fastening of the lamp itself, and the upper is solid, the upper part sliding, and fitting accurately, upon the lower. When ready, he closes the lower mould, by means of long handles, like those of an old-fashioned waffle-iron, and secured in the same general way—only these move in their hinge laterally, instead of vertically—and, in the same movement, adjusts the upper and the lower parts of the mould, leaving upwards the wide open mouth of the latter, which corresponds to the bottom of the lamp-stand. An assistant now drops into the mould an elongating red-hot lump of glass, which the first cuts from the rod, with a large pair of shears, at the same instant pushing the combined mould back to a rest, upon the table of the press. The plunger now descends, and forces the glass into all the minute ramifications of the mould. The plunger rising, the mould is withdrawn, and the lower part unclasped, enabling the operator to lift in his left hand the moulded

glass itself, in the upper part of the mould, which is provided with a handle, at the same time fanning the glass briskly for a few seconds with a common fan, held in his right hand, in order to cool it. He now relieves the stand from the mould with a slight tap, which causes it to rest in the bottom of a little trough, or dry vat, and taking it up, on a broad little wooden spatula, turns it out upon an iron table, bottom downwards. This last motion, the glass being yet warm, and the table perfectly level, causes the stand, by its own weight, to assume the exact shape for resting steadily, when in use. As soon as two are ready, a boy upon an iron instrument, like a baker's peel, carries them to the annealing furnace. This method is for the larger sizes, the smaller ones, treated in every other respect the same way, are not fanned.

Directly across, and near the opposite side of the place, with a table before him, supporting two open hexagonal moulds, in a heavy iron plate, is a stalwart man forming

TILES.

An assistant brings the glass on the end of an iron rod; and allows it to fall slowly upon the centre of the depression of a mould, when, by estimate, the workman cuts it away from the lump on the rod, with a large pair of ordinary shears. The moulder then smooths off the top of the mass—or the bottom of the tile—by means of a little board, about half an inch thick, seven inches wide and twenty inches long, which he rotates very briskly over the mass, thus forcing it into all the corners of the mould. Then, sprinkling along a little damp sand upon the glass, he rotates the board upon it again, grinding in the sand, to roughen the under surface of the tile for the cement, in the final setting for floor or pavement. A second tile is formed in the same manner. He then stands up the mould plate; and with a slight tap, disengages the tiles.

He next sprinkles both moulds with water, to cool them for the succeeding pair. In the whole process, he looks like a spirit, of the terrene realm of fire, engaged in some choice salamandrine cookery. These tiles cool with some tendency towards concavity, just within their edges on top; but this is obviated by grinding them perfectly level, and finishing with a waxy lustre, that they may not be too smooth for the feet.

The tiles being turned out upon an iron table, boys whisk them off to the annealing furnace.

A few steps further, and we reach a tall active man, with a press before him, similar to that of the lamp-stand moulder, but rather lighter in construction. He is engaged in making tops for little, round, flat

POMATUM CUPS,

or boxes; the boxes themselves are formed in the same way. He has a little iron mould, with a separate iron collar, into which his assistant, from an iron rod, drops a small lump of molten glass, which the moulder cuts away from the glowing bottom of the rod, with a light pair of scissors, when the combined mould is pushed backward, on the press table, to its rest; and instantly a plunger descends; and drives the yielding glass into every part of the mould. Then the plunger rising, the mould is withdrawn; and the workman stirs the square end of a little piece of board, say about an inch and a half wide, briskly around in the glass on the open mould, to keep the top of the new-formed cover well against the bottom of the mould, and this being opened, the cover is dropped out, and, as before, carried away by a boy to the annealing furnace. The cups or boxes, here described, would answer as well for shaving-cream, or any substance of an unctuous nature.

Moving around the spacious building; and returning almost to the point where entered, we find a pair of sturdy workmen busy making conical

LAMP OR GAS-SHADES.

This pair, as in all the other cases, have several younger assistants. The assistant blower takes the molten glass out of the furnace upon his long iron blow-pipe; puffs it out to the size of a large apple; and partially shapes it, by means of a wooden mould, which he holds in one hand—with about two-fifths of one side cut away, so that its interior is of a very concave shape—by revolving within it the glass upon the rod, by means of which the mass is half formed and put back again into the incandescent fluid in the furnace, for a fresh accretion. The tube—now taken by the principal workman—while the assistant returns to the former operation—is then blown into, swayed backward and forward—revolved, in order to obtain length and partial regularity in the combined mass—and the elongated flask rested revolvingly upon the bottom of a side-acting hinged wooden mould, opportunely opened by an attendant boy, seated upon the pavement, with the mould between his legs, so that he can readily look into it, for the proper time of closing, which is when the whirling, flattening mass—becoming like an obtuse hollow cone, closed in at the bottom, nearly fills its mould, which being tightly closed, the workman blows and revolves his blow-pipe very briskly for a few seconds; and, the mould being open, he takes his rod to the edge of a trough or dry vat; and shaping the neck, or upper part, by revolving it within the blades of a pair of plyers; and, giving the thin glass a little above, a smart tap, he detaches the shade, which is immediately taken up by a boy with a rod and hurried to the annealing furnaces. The glass bottom of the shade is cut out afterwards, by running a hot slight iron rod around upon the edge of the shade.

In all these processes, both the iron rods and the iron blow-pipes are guarded near their upper ends, or wher-

ever wielded, with thick twine, wrapped around them, for the continuous space of about eighteen to twenty inches, in order to protect the hands of the workman from the cumulative effects of heat; and, we suppose, that, in addition, the workmen have spare ones, to allow those in use for awhile to cool off.

There is no waste, whatever, in the fragmentary material, which is all gathered up again, and re-melted, in the crucibles, for any future operations.

We have reiterated the annealing, at the end of each separate process, because, as absolutely necessary to toughen the glass for use, it is well to fasten it in the mind. All the articles are five hours each in passing through the annealing furnace, when they re-appear, on the opposite side, in another apartment, where youths are constantly watching, either to bear them away to the store-room shelves, or, if the commercial hurry of the Company requires, to pack them, at once, for distant transportation.

The whole establishment is exceedingly busy and brisk. Indeed, in the furnace room, it is necessary to be wary, because, although the men are polite and careful, they must be alert, and may not observe you. Should you, perchance, pass between the moulders and the furnace door, you are in great danger of a serious and searing burn, from the lumps of red hot glass, on rod, or tube, ceaselessly flung about, on every side.

This Company also manufacture occasionally, and will constantly, after

New Year, 1869, at the works of THE ATLANTIC QUARTZ COMPANY, No. 3045 and 3047 Chestnut street, West Philadelphia. Their present business office is in the hall of the Franklin Institute, but will shortly be at the north-east corner of Seventh and Walnut streets.

Hot-Cast Porcelain is, though yet in its infancy, a successful rival of china, glass, bisque, and other substances of their general nature, as hinted in the beginning of this sketch, for all the smaller objects and utensils, designed either for ornament alone, or for elegant use. But its capabilities extend far beyond these lesser luxuries of society.

The greater luxuries are chaste and lustrous exteriors, and polished and elegant interiors, for the homes of men. Much time and capital have been expended in the production of artificial stone, which—from the facility of producing it of almost any given size and shape—will look well in masonry, and yet afford lines, which cannot, *as cheaply*, be given to natural materials by the stone-cutter.

But the gentlemen concerned have aspirations far beyond this, confidently hoping, as they do, to produce in the near future, a choice and not uneconomical material, in blocks, for the finest building-fronts, which shall receive, if desirable, a fine polish, and yet withstand, without disintegrating, the quick-sapping effects of the American climate, in its utmost stress. We sincerely wish them Good Speed!

ADAMS' WOOD-GRAINING MACHINE.

HITHERTO the art of imitating the grain of woods, in Painting, has been, in the hands of the best artists, but a tedious operation. The inventive genius of our countrymen, ever on the lookout for chances of improving and

accelerating the labor of the artisan, has not failed the occasion here.

We have seldom seen a more perfect piece of graining, than that produced by ADAMS' AIR-CYLINDER GRAINING-MACHINE. In fact, we are firmly convinced

that this admirable little aid to labor is destined to do away, altogether, with the old-fashioned system of the stain and rag, in which we were so dependent on the ability of the workman, and in a great measure, also, on his taste, such as it might be.

The machine in question grains in oil colors, giving very perfect imitations of walnut, rosewood, chestnut and oak in every variety. Nothing can be more certain or accurate than its work; and its impressions are as sharp and true, as it is possible for any thing to be. It saves a great deal of hand-labor; and is alike applicable to flat or curved surfaces.

It is strongly constructed of vulcanized rubber, with brass side-plates; and will do good service for years, with ordinary care.

It is an air-filled, revolving cylinder, of which there are two sizes, one of eight inches, the other of five, easily inflated, and as easily compressed, when desirable, to meet the exigencies of width of panel. The graining-bands are made for the various grains; and are ten in number, at the selection of the purchaser. These graining-bands are easily placed upon the cylinders; and each is continuous, thus avoiding laps or breaks. The largest size of this Machine weighs but eleven pounds, and any painter can manipulate it with ease after one or two days' practice.

Printed directions are given with each machine, by which any one can learn the immediate use of it. The usual oil-graining colors may be employed with great success.

A CONCRETE PRESS.

THE nature and power of *Concrete* is well known, and the economy of its use much studied, even in our country, where the various materials called into use for building purposes are so liberally placed by nature within our reach.

For nearly twenty years Concrete has been used in the West in the construction of houses; and, notwithstanding the very imperfect manner of its composition, the walls built of it are found to be durable. But the strength of this material was not attainable by the mere casting of it within boarded sidings. It became necessary to submit this concrete to an amount of pressure, which might have the effect of indurating it. And not alone that, but there was a necessity for casting the material into a form easy of manipulation—such as bricks. A Mr. Foster was the first to devise a press for this purpose, which he patented, and which is still in use, turning out a very creditable article of hollow brick. His press, however, though possessing great power, was far too slow for the requirements of cheap walling;

one, and the chief of which, is speedy action. It became necessary, therefore, to use several of Mr. Foster's presses, in order to meet the demand. This increased number of machines, or presses, involved the employment of a number of additional hands, which fact materially increased the expense of the work. Here, then, was a very serious obstacle to the popularity of the invention.

But, improvement is always in order; and we now have the pleasure to draw attention to a new machine for this purpose, the excellence of which is unquestionable. It bears the very impressive title of **THE LITTLE GIANT**. It is a portable Concrete Press, for Manufacturing Concrete Building Blocks. It is worked by hand, with great ease and rapidity, and with it one man can press 1,500 blocks per day, at an expense less than that of burned brick. It is highly recommended by numerous architects, builders, and others in the West, where it has been most successfully tested; and we feel great pleasure in endorsing its merits.

TABLE OF SLATES:
SHOWING THE NUMBER OF EACH SIZE OF SLATE
REQUIRED FOR
ONE SQUARE OF ROOF.

SIZE.	No.	SIZE.	No.	SIZE.	No.
6 × 12	533	9 × 16	246	12 × 20	141
7 × 12	457	10 × 16	221	14 × 20	121
8 × 12	400	12 × 16	184	11 × 22	137
9 × 12	355	9 × 18	213	12 × 22	126
7 × 14	374	10 × 18	192	14 × 22	108
8 × 14	327	11 × 18	175	12 × 24	114
9 × 14	291	12 × 18	160	14 × 24	97
10 × 14	261	10 × 20	169	16 × 24	86
8 × 16	272	11 × 20	154		

A SQUARE OF SLATE is what will measure one hundred square feet, when upon the Roof.

Whenever Slates are purchased by the square, it has become an invariable rule, to allow three inches for the distance the third covers the first, or, to use the technical phraseology of Slaters, three inches over-lap.

The contents of a roof is found by multiplying the length of the ridge by the girt from eave to eave; and, in Slating, just so much allowance must be made, for the double row of slate at the eaves, as there would be in a single row of slate. For example, if the slates are sixteen inches long, they will lay six and a half inches to the weather, therefore six and a half inches should be allowed.

One foot, linear measure, is allowed, on valleys and hips, for the extra labor of cutting, fitting, and laying, and the waste of slate.

Example: if a valley or hip is twenty feet long, twenty feet will be added to the surface measure of the roof.

No deduction is made for chimneys, scuttles, &c., unless they are more than four feet square

We have been indebted, for the above information, to the kindness of a friend, who is a practical Slater; and with his assistance and the aid of a very useful little book, called "THE SLATER'S GUIDE," we have been enabled to complete the foregoing Table, which may be useful to those not familiar with the mode in which slate is employed for roofing purposes; and the method of measuring a roof, when so covered.

The above is a practical and common-sense view of the subject, such as comes into every day's notice and practice, and upon which all contracts are invariably based. Indeed, so universally known is the formula, which we have here given, among all business men, who have any building operations, that, even when there is no contract made, it forms the basis of the settlement, for the work undertaken and completed, on a mere verbal understanding.

SLATING AND SLATE.

THERE are various different methods of securing slates on the roofs, which we will briefly discuss. Sometimes they are fastened on lath, usually termed shingling laths, which are nailed on to the rafters, the latter being spaced apart, just so much as the slate is exposed to the weather. In this case, it is requisite, that a full coating of plasterer's mortar should be given beneath the slates and between the laths, and not simply pointing lightly along the joints and edges. The main object of this full coating is to prevent the passage of currents of air or wind, which carry along with them drifting snow, through the crevices which are left, when such is omitted.

The practice of simply pointing is one that cannot be too strongly condemned and reprobated, as being nothing more nor less than an attempt to evade the faithful fulfilment of a contract, according to the full intent and meaning of the specifications, in which it is only usual to mention, in general terms, that, when slate are laid on laths, they shall be pointed with mortar, beneath the slate, and between the laths. The object desired is to obtain a perfect air-and-water-tight covering for the roof, which can only be secured by a full coating as above; and not by any makeshift, such as simple pointing, which is only resorted to by the slater, for the purpose of carrying out, what would seem to be the letter, but not the spirit, of the contract. The result is, that the owner of the building, not being practically versed in such matters, takes it for granted, that the slater has acted up to the contract; and performed all that was required of him, in order to render the roof proof against leakage; and only discovers the deception and the makeshift, that have been imposed upon him, by finding, during the first winter-

storm that he encounters, the snow, drifting in through the crevices, that have been allowed to exist by the simple pointing of the latter, and filling up his loft by the bushel. This practice is the more strongly to be censured, in so much, as it tends to create a very erroneous, but it must be allowed, a natural prejudice against slate roofs in general. We, ourselves, in our own practice, have, on several occasions, met with instances, in which the roofs were condemned, and, for no other reason, than that the slater had been guilty of the very practice, against which we have thought it here a duty to enter our protest. To insure against any such complaints and condemnation of roofs, it is essential, we repeat, that the slate be laid with the proper over-lap, not less than 3 inches; that the pitch of a roof for slate should never be less than 25 degrees; and that a full coat of hair mortar be spread, over the whole surface between the laths. This will effectually close every crevice and aperture against the possibility of admitting any currents of wind, drifts of snow, &c.

The mode of securing slate on roofs, which is at present in general adoption, is first to sheath the whole surface with boards, and overlay these with two thicknesses of roofing felt, so-called, but which is nothing more, than thick sheathing paper, saturated with the fluid refuse of coal gas tar, and manufactured, of late years, principally for composition roofs, such as gravel, &c.

On account of the very difficulties, which we have just described, proceeding from the practice of some slaters substituting simple pointing for the full coating of mortar, this felt has come into pretty general use, in lieu of the mortar; and has proved to be a most valuable means of obtaining a sure and secure protection against the weather.

We have mentioned above, that the felt should be laid on in two thicknesses. This should always be done, when the roof is of an ordinary pitch; but when it is steep, such as, for instance, a French roof, a single thickness will suffice, provided a proper overlap is given.

In addition to the advantage gained by the use of felt, in the place of mortar, which we have already stated, viz. that it precludes all possibility of any successful attempt at passing off a makeshift and bad work; it also possesses another, which is equally important, viz.: that it can be used on roofs, that are laid quite late in the season, at a time when, from the inclemency of the weather, frost, &c., it would be utterly impossible to employ mortar.

The old method was, to lay slate in mortar, coating every course as it was laid. This was done with mortar composed of lime and sand, and spread very thin, so that it left but little substance. This, however, has fallen entirely out of practice; and has been abandoned, since the introduction of the two other modes, which we have described.

The slate are usually secured to the laths, or boards, which should be of hemlock, with iron nails, boiled in linseed oil, in order to protect them from rust. Sometimes copper nails, and, again, galvanized iron nails are used.

In cases where the framework of the roof is constructed with iron, the slate are secured with copper wire to the iron lath.

The use of slate for roofing purposes, is of very remote antiquity. Pliny mentions, that the Celtæ employed a white stone, that was divided by them more easily than wood, and sawn into thin plates for tiles. Some Roman buildings, the remains of which have been discovered of late years in Great Britain, afford indisputable evidence, that they were actually roofed with slates, fastened on with nails of iron, hooked, long and large.

Slate is of common occurrence in dis-

tricts of the metamorphic and silurian formations; but, wherever found, it is rarely met with of a sufficiently good quality for working, until it has been dug down to a depth, beyond the reach of atmospheric influences. Quarries of great extent are worked in North Wales, and in parts of England, Scotland and Ireland; but the first are those from which the market in America has been almost exclusively supplied, up to within a short time past; and which are, therefore, perhaps, deserving a brief description, which we are enabled to give, from notes taken on a personal inspection.

The principal quarries are situated about five miles from the town of Bangor, in Caernarvonshire, in North Wales; and are of immense extent; the beds having been traced several miles in length; and the excavations being of a very imposing nature. They extend into the sides of the hills, in a succession of terraces, or ledges, one over the other, sometimes to the number of twelve; each of them sixty feet high; and on these are tramways for wagons, drawn by horses, for carrying away the material excavated. Every improvement and appliance in mechanical skill, that is known in England, have been brought to bear upon the working of these quarries; and some idea of the vastness of the operations here carried on may be formed, when we state, that there are close upon, if not quite, 3,000 men and boys constantly employed; not including about 500 more, who are daily at work, unloading and loading the slates at Port Penrhyn, at the entrance of the Menai Straits, whence the product of the quarries is exported to all parts of the world. About 200 tons of slate are daily transported from the quarries to this port. The scene, to be here daily witnessed, is one full of interest, which seemed to us, one of the busiest we had ever had the good fortune to view.

The succession of terraces, one over

the other, on which the teams of the several tramways were at work; the numbers of quarrymen employed, excavating and cutting the slates, who seemed to swarm in every direction, some slung in rope baskets, and others on wooden platforms, suspended by ropes over the face of the cliffs; the underground galleries, through which the tramways run; the pumping engines; the heaps of slate lying in every direction; and, lastly, the hydraulic lifts by means of which the slates are brought up, from each of the lower terraces, to the surface.

The owner, Colonel Pennant, has acquired an enormous fortune by the working of these quarries; and owns, in the immediate neighborhood, an immense castellated mansion, called Penrhyn Castle, most romantically situated on the Menai Straits; on which money has been lavished, with an unsparing hand, to render it one of the most superb and magnificent residences in England. Some conception may be formed of it, when we state, that, of the two entrance gates, one cost £12,000, and the other £10,000! To him, however, much credit must be given, for the very generous and liberal manner, in which he has provided accommodation for the large body of laborers, through whose toil he has become rich.

About a mile from the quarries a village has sprung up, to which has been given the name of Bethesda, inhabited exclusively by the quarrymen and their families, amounting in all to 11,000 souls. Colonel Pennant has erected here a number of model dwelling-houses, which are rented at very low terms; and he has built, at his own expense, a very handsome church, reading-rooms, and a national school-house.

The export of these Welsh slates has, of late years, received a severe check by the opening of valuable quarries, in different parts of the United States, for instance, in Vermont, New York, Pennsylvania and Maryland.

The principal ones in Vermont are in West Castleton and Poulteney, Rutland county, and in Guilford, Windham county. Operations were there commenced in 1852; and they are now being carried on by several independent associations. Though these quarries are of no great depth, the beds have been traced many miles in length; and the slates obtained, fully equal in quality to the Welsh, and are excavated with great facility.

In New York, slate is found at Granville and Hoosic, Washington county; and the formation crosses northern New Jersey, and is worked near Newton, in Sussex county, and on the Delaware river. On the north side of this river, it ranges across Northampton and Lehigh counties, Pennsylvania, the north line being on the Blue, or Kittatinny Mountain.

The Lehigh quarries are near the foot of the same mountain, about two miles from the Lehigh Water Gap. They were first opened in 1848 and in 1852. The quantity produced was 2,500 squares of roofing slate, and 800 cases of school slates, each case holding about 100, and the production has been increasing annually ever since. In Lehigh county, alone, there are some thirty slate quarries, all worked, and producing, in the aggregate, about 25,000 squares of roofing slate during the year, worth \$75,000 at the quarry.

The best description of slates—regarded by the dealers as superior in quality—are obtained from the Peach Bottom quarries, on the Susquehanna river, in Maryland. Good slate is found still further south, in Pike county, in northwestern Georgia.

We have, as yet, only regarded slate in its adaptation for roofing purposes; but it has been most successfully introduced into use, for a variety of other objects, which we can only here briefly enumerate. The thicker sheets obtained in the splitting are employed as grave-stones, flagging, billiard-tables, mantel-

pieces, partitions, floors, table-tops, sinks, and for other architectural and internal decorative and useful purposes. Various ornamental articles have also

been prepared of slate in imitation of marbles, granite, &c., by applying different colors, which are baked in, polished and varnished.

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING

No. 4.

IN a former paper, the term *Natural* was used, to distinguish the opposite style of the treatment of grounds, to that of the *Geometrical*. The term is not a particularly happy one, as used for this purpose; and yet it indicates, somewhat clearly, the character of the imitation it desires to express.

In the *Geometrical* style, the interference and result of art is shown in every line; the whole arrangement is so distinctly different from any natural production, that it is at once recognized as a work of art, and contrasts so strongly with natural scenery, that it becomes perfectly satisfactory to the beholder.

In the *Natural* style, there is nothing produced, so far as relates to landscape and views, that seems unusual in unassisted nature; or, that might not have been natural to the locality; at least so far as regards the general scenic effect of the composition. All natural beauties and peculiarities are carefully studied, and preserved, to the extent consistent with utility; but there is no desire whatever to disavow art. Nature is imitated, in a similar manner as in sculpture or painting, but the imitation will not be taken for the original. The aim of artists is simply to show the original, in as distinct a manner, as the nature of the materials employed will admit. They are not intended to be taken for any thing but an imitation, more or less meritorious.

In the disposition of trees and shrubs, although the arrangement is such as might be taken for a natural group, yet the kind of plants employed, will show

that they are not indigenous to the spot. In a locality where evergreens do not grow naturally, their presence will indicate the interference of art and design, and thus give an essential character to the scene. Art, however, must not appear obtrusive, for

"Great Nature scorns control; 'tis thine alone
To mend, not change her features. Does her hand
Stretch forth a level lawn? Ah, hope not thou
To lift the mountain there. Do mountains frown
Around? Ah, wish not there the level lawn."

The term *Natural* is therefore to be understood as applying to generalities, rather than to details. A trodden foot-path—curving gracefully around the side of a hill, or on the banks of a stream, now embracing a group of indigenous trees, bordered with an undergrowth of blackberries, and other native shrubs; again, turning more abruptly, as it winds through the tangled thicket of twining vines, or, sweeping over a meadow, its outline alternately widening and narrowing; at times scarcely visible from the overlapping foliage of grasses and weeds—would be pronounced strictly natural. But let this path be widened, and its surface neatly covered with gravel, its curves defined, and its sides made perfectly parallel; and the naturalness it formerly possessed is now in a great measure destroyed, although the scenery is in no degree impaired. Still, its general effect may be none the less beautiful; but its beauty is now of a different character. In its former state, while we might admire its naturalness, yet, for comfort and utility, we greatly prefer its improved condition. We also trace in the latter, a design, a fitness of

purpose for the object in view, that is, a comfortable and convenient walk. All the beauty it received from variety, in its curves and windings, the objects it passed, and the views to which it led, are still retained, and, in addition, it is now invested with the beauty of utility.

But if art has so far interfered, as to change the course of the path making a perfectly straight line from one extreme point to the other, removing, where necessary, the natural vegetation, smoothing down the prominences, and filling up hollows, then we divest it of every vestige of the natural, and, with it, all the pleasing emotions produced when contemplating its former outlines. It is now purely artificial. There is no harmony existing between it and its surroundings. If it has any beauty, it is exclusively that of utility and must be judged by the importance of the necessity that produced it.

This may be illustrated by the straight line and level surface of a railway. We know that its importance, success, and value, demand this preparation and finish, and whatever of beauty we may accord to it, will be influenced by its apparent fitness for its purpose, and probably a railroad engineer, of strong utilitarian views, would pronounce it the most beautiful form of all.

In addition to the change made on the appearance of the walk, suppose we remove the native growth embraced in its scenery, and supply its place with a collection of trees and shrubs that are foreign, either to the locality, or to the country. The outlines and general effect of this new plantation, may correspond very closely to that removed, it being bordered on the margin with low-growing suitable shrubs, neat in appearance, and ornamented with flowers. As a feature in the scenery, this will appear as natural as the original; but a closer investigation will discover an additional interest, in the greater variety of individuals composing the group; and it is

invested with this additional charm, without detracting in any degree from its other qualities.

A classified variety of this style has been very generally treated upon, by landscape-gardening authors, under the name of the Picturesque. This is the accidental beauty of a scene, or that resulting from the association of ideas, and is of a decidedly distinctive character, relatively to other elements of beauty. It would be vain to attempt to classify, or enumerate picturesque objects, because the beauty resulting from their contemplation, is not so much conveyed by the organic sense of vision, as by the intellect and imagination through that sense. To a richly stored mind, almost every object in nature, that presents itself to the senses, may awaken long dormant ideas, or recall pleasing reminiscences; and as the materials for association are increased, so will the sphere of these emotions be enlarged.

On this subject, Alison, in his essays on the nature and principles of taste, has the following remarks:

"Such associations, instead of being common to all mankind, are peculiar to the individual. They take their rise from education, from peculiar habits of thought, from situation, from profession; and the beauty they produce is felt only by those, whom similar causes have led to the formation of similar associations. There are few persons who have not associations of this kind, with particular scenes, from their being familiar to them from their infancy, and thus connected with the gay and pleasing imagery of that period of life; from their connection with scenes to which they look back with pleasure, or people whose memories they love; and such scenes, from this accidental connection, are never seen, without being in some measure the signs of all those affecting and endearing recollections."

Picturesque beauty is a beauty of suggestion resulting from association of

ideas. It is unconnected in our minds with any other of the elements of beauty, although the object or scene need not necessarily be devoid of such elements; but they, at the time, do not exercise any great influence upon our imagination. The emotions produced will be heightened and increased, when connected with grandeur and sublimity; and their intensity will, at all times, be controlled by the nature of the association, from whence they proceeded, or, that called them into existence.

A simple flower, blooming on the bank of a stream, may recall scenes of youth and pleasant recollections, without any effort of the memory.

If, in my walks, I see a plant that I have not met since early boyhood, but which grew abundantly in a locality, where I then resorted,

"With ill-fashioned hook,
To draw th' incautions minnow from the brook,"

immediately all the scenery of the situation, and many of the incidents of the period are presented to my mind, as if I viewed them in a picture; and that without any effort of memory. To me, that plant is picturesque; my companion, who has, perhaps, never before seen the plant, may admire the beauty of its foliage or flowers; but its presence has no connection with previous association; and he passes it without any emotion. It is related of an Otaheitean, visiting the Jardin des Plantes, of Paris, that he sprang forward at the unexpected sight of a banana tree, embraced it, and with tears in his eyes, exclaimed: "Ah! tree of my country!"

Amidst all the splendors of that city, that tree transported him at once, in imagination, thousands of miles distant, to the home of his boyhood, with all its tender associations and endearing memories.

While I consider that, strictly speaking, picturesque beauty is simply the beauty of association; and that it cannot be treated as a style, in the sense implied by the terms geometrical and

natural, yet there are scenes in nature, that most persons of literary culture, mutually agree in describing as picturesque. A mountain stream plunging over rocky precipices, rugged pine trees growing on rocky eminences, old ruins weather-stained and moss-covered, steep mouldering cliffs, and rocky coasts washed by the spray of the sea, are objects of this kind, well calculated to awaken interesting emotions, and originate a train of retrospective thought; but, practically, the beauty of association, or the picturesque, is not an artificial production bound by rules that can allow of its classification as a *style* of gardening.

The picturesque has been defined, as indicating any scene or object, that would look well in a painting. This appears to be a very meagre and unsatisfactory definition. There seems to be no conclusive reason, why this would not include every object in nature, because, in criticising a work of art, our attention is not so much directed to the beauty of the subject imitated, as to the merits of the imitation. There are many natural scenes, quiet, pleasing, rural views, such as are frequently observed in a cultivated campaign country, which make a very satisfactory composition for a painting; and yet do not possess, to any degree, those more striking characteristics generally felt, or designated, as picturesque. Again, natural objects of great scenic splendor seem to be but imperfectly described by this term; although, as subjects for paintings, they stand in the foremost class. To describe the falls of Niagara as picturesque would be but a weak expression of their grandeur; they are sublime.

I therefore think it probable, that the more correct definition of the word picturesque is, any object or scene in nature, in painting, or in poetical description, that recalls, or suggests, a picture to the imagination, through the association of ideas.

We have many examples of this kind in poetry, such as the following from Darwin's "Temple of Nature," where almost every line is vividly suggestive: mark:—

"The rush-thatched cottage on the purple moor,
Where ruddy children frolic round the door;
The moss-grown antlers of the aged oak;
The shaggy locks that fringe the colt unbroke;
The bearded goat, with nimble eyes, that glare
Through the long tissue of his hoary hair,
As, with quick step, he climbs the ruined wall,
And crops the ivy which prevents its fall."

We have another beautiful picture, of more harmonious softness and mellow tone; and one that recalls some impression upon the *ear*, at the same time that it appeals to the mind, from Goldsmith's *Deserted Village*—

"Sweet was the sound, when oft, at evening's close,
Up yonder hill the village murmur rose.
There, as I passed with careless steps and slow,
The mingled notes came softened from below;
The swain responsive, as the milkmaid sung;
The sober herd, that low'd to meet their young;
The noisy geese, that gabbled o'er the pool;
The playful children, just let loose from school;
The watch-dog's voice, that bay'd the whispering wind;
And the loud laugh, that spoke the vacant mind;
These, all in soft confusion, sought the shade;
And fill'd each pause the nightingale had made."

A variety of the natural style is distinguished as the gardenesque. In carrying out this mode, the trees and shrubs are disposed in such a manner, that they may rarely meet or touch each other during after growth, so that the individual beauty of each plant will be fully developed. The groups must show each plant distinctly; but it is not necessary that the plants should show any thing like a uniformity of being equally distant apart, as this would produce monotony; yet the separation should be complete. There are no bold masses of light and shade in this treatment, at least not until the plants have attained considerable size, and in grounds of great extent. Every thing must indicate high keeping and superior care in

cultivation. It is graceful, rather than grand; and its partial introduction in the arrangement of scenery is always productive of pleasing effects.

In my earlier studies of the principles of beauty, and their application to landscape gardening, I found, on comparing the conclusions which I had reached, with the published opinions and systems of those who had written practical treatises on the subject, that I could not appreciate their designations of various distinct styles. Especially was this the case with those termed the *Picturesque* and the *Graceful*, when treated as contrasting modes, or distinct species. The very imperfect definitions, and the still more imperfect, oftentimes vague and contradictory, explanations afforded no assistance. On the contrary, they only showed convincing proof that these so-called styles are simply varieties, or relative beauties of what I have termed the *Natural*. Viewed in this light all difficulty vanishes.

I have, therefore, in a former number, remarked that there are only two distinct styles—the Geometrical and the Natural—all other applied terms being varieties, more or less distinctly marked, of these.

There are many objects in nature that are strongly picturesque, and at the same time exceedingly graceful. As an example of this combination I would mention the weeping-willow, (*Salix Babylonica*.) The historical associations of this plant in connection with the tomb of Napoleon, at St. Helena, invest it with a high degree of picturesque beauty, while its beautiful form and graceful habit of growth are not excelled by that of any other tree.

WILLIAM SAUNDERS.

WASHINGTON, D. C.

December, 1868.

NOTE.—The above finishes the present series on styles of Gardening. Mr. Saunders—whose articles, we are assured, have been perused by our patrons with unfeigned pleasure—intends next proceeding with a series, "Upon the Selection of Sites for Country Residences, &c.," to be accompanied by occasional sketches.—Eds.

ORGANS.

ORGANS have become so indispensable a feature in the fitting up of a church, and, from their unquestionable superiority over all other instruments, are so suitable and appropriate for the majesty of divine worship, that a few remarks upon their size, and the proper position in which they should be situated, may not be out of place; as upon these two points, and more especially the latter, depends in a great measure, the effectiveness of the instrument.

First, as to the size. It is a great mistake to regulate this alone by the size of the building for which it is designed. A very small organ, of but comparatively trifling cost, will often be sufficient to meet the requirements of a large congregation, where there is but little musical taste and ambition; whereas, another congregation, perhaps smaller in actual numbers, but possessing a much higher, and more cultivated musical appreciation and refinement, would not be satisfied with any thing less than the largest instrument, with the greatest possible amount of power and effectiveness, combined with beauty and variety of tone, and elegant and ornate exterior. The only arbitrary limits, upon the size of organs, should be the dimensions of the space that can be allowed for them, and the extent of the appropriation available. Apart from these two considerations, which of course are paramount, they cannot be too large, in order that they may possess unlimited power and range of stops, capable of producing effects appropriate for all occasions. If the church is comparatively small, the instances in which it may be necessary to use the full power, of the organ, are perhaps rare; but it should be so constructed, as to be adapted for such a purpose, that it may be grand and impressive, without being too loud. Were power alone to be considered, a

smaller instrument might answer; but where such would allow of only a small variety of tones, an almost endless variation of beautiful combinations and effects could be obtained from the largest instrument.

The following dimensions may be of some service in determining the spaces that should be allowed for organs of different sizes.

	Height.	Width.	Depth.
One manual, 10 to 15 stops,	10 to 15 ft.	7 to 8 ft.	6 to 7 ft.
Two " 20 to 25 "	16 to 20 "	10 to 12 "	6 to 8 "
" " 25 to 30 "	16 to 20 "	12 to 15 "	8 to 10 "
Three " 35 to 40 "	20 to 25 "	15 to 18 "	12 to 14 "
" " 45 to 50 "	25 to 28 "	18 to 20 "	15 to 18 "

These dimensions must be regarded as the *least* space that should be given; *more* would be desirable, especially in height, where such can be obtained. A greater increase in depth would, in most cases, allow the height to be considerably reduced.

The second point, as to the proper position of an organ, is of more importance than the other; as on this depends, in a great measure, the size of the instrument required, and also its value and adaptation for the building. A finely-toned organ, upon which the builder may have exercised his utmost skill, is often, by the choice of an unfavorable position, deprived of a great portion of its dignity, grandeur, and sweetness of tone. In order that a judicious selection on this important point be obtained, not alone should the first principles of music and of acoustics be studied and followed, but it is absolutely requisite, that the architect who designed the edifice, should be consulted, so that the organ may not be placed in a position to disfigure the architectural beauties, or to ruin the proportions of his building. This latter is a point, which does not meet with the consideration it deserves, either from architects, or congregations, for it sometimes happens, that, at the time of the

designing and erecting of a church, the subject of the organ is not kept in view; perhaps, from the fact of there not being funds available for the purpose; and there is no provision made for its subsequent attainment in the design determined upon. consequently, the instrument, when it does arrive, has to be located without any reference, either as to acoustic or architectural effects, beyond what the nature of the building may permit.

The enrichment and augmentation produced by resonance, and the inexpressible, charming, buoyant, and lingering effect imparted by echo, must depend upon the building, the nature of the materials of which it is composed, and its surroundings, and cannot be given by the organ builder. A most remarkable, and at the time well known illustration of the truth of this, was afforded by the enormous organ built by Mr. Willis, which stood at the west end of the first Crystal Palace, in London. Although this instrument contained three sets of manuals, a very large number of stops, and a large pedal organ, from the fact of the immense quantity of glass, of which the building was composed, almost entirely destroying reverberation, or resonance, it was not in effect so powerful, as another organ in a church in London, with only one row of keys, and eight stops.

The best position is where the organ can be central, elevated, unconfined, and have ample room. On account of the difficulty that is generally experienced, in allowing sufficient space for a central location, behind the pulpit, the almost universal custom has been adopted of locating the organ at the opposite end of the church, facing the pulpit, and admittedly with great success and happy results. But there can be very little question, that for Protestant churches, and, indeed, in every church, of whatever denomination, where *congregational* singing is regarded as an indispensable feature to congregational worship, the

most appropriate place for the organ would be in front of, and not behind, the congregation; as, if the people are expected to join in the singing, they must be in a measure dependent on the choir, who, in that case, are organized to sing, not *to*, or *for* them, but *with* them; and the choir and organ should be so placed, as to be in the best position to enable them to be of the service required. There is, we believe, a growing feeling among Protestant churches, in favor of having the organ located in front of the congregation; but still this subject must always be regulated more or less by the size and shape of the church.

We have said the organ should be elevated. By this means the tone is more generally diffused throughout the church, and is not so overpowering to that portion of the congregation, which may happen to be seated in its immediate vicinity. A height above the gallery or platform, should be provided, sufficient for the construction of the organ, and allow space above, when possible, as this gives a mellowing, and highly advantageous effect. On the other hand, when the instrument is, as is too often the case, crowded under a low ceiling or roof, its tones smothered, and its whole action impeded, it has a severe and disintegrated tone, alike displeasing to organist and singers. Where the obstacles to the diffusion of the sound are so numerous, and so close to the organ, it is almost impossible to produce a proper quality of tone, especially from large pipes. An organ so placed is more liable to be out of tune, by the effect of the higher temperature, which surrounds the pipes standing close up against the ceiling.

A free circulation of air is desirable through and around an organ, not only to prevent dampness, but to have an even temperature throughout all its parts. The effect upon the tones, where an organ occupies a recess, is to somewhat subdue its power; but, by skill and

management on the part of the organ builder, this can be in a great measure obviated, in the arrangement of the parts, and character of the voicing. It is particularly desirable an organ should not be crowded, especially within a recess, but that, wherever possible, room for a passage on each side, and behind it, be allowed.

We are indebted for many of the

points which we have here collected together, and laid before our readers, to the kindness of Messrs. E. & G. G. Hook, manufacturers of Church Organs, Boston, Mass., who have produced, amongst many hundreds of their instruments, supplied to every part of the country, the five largest and most complete organs ever built in America, and, perhaps, in the world.

SCIENCE OF BUILDING.

IT would be supposed, that after the lapse of so many centuries since the creation of the world, during which the erection of habitations for man, of temples to a known or unknown God, of commercial marts and of palaces was constantly carried on, that the science of building would now be exhausted, from having reached perfection; but, strange to say, it is not; although, from the completion of the Pyramids to the present hour, thousands of men have cultivated the science, and millions have engaged in the art.

The general arts and sciences have been fostered, till now, in the nineteenth century, we view our achievements with pride; and look back, with pity, upon generations past, which lived, without all these improvements; yet, I say, we are only infants in science. Our own daily developments and discoveries constantly reveal to us hidden and unknown objects and ideas; a race yet unborn will as far eclipse us, as we have eclipsed our predecessors, whom we only surpass in the means to build.

I am forced to acknowledge, that during the past 500 years, the science of building has advanced slowly, until during this last century, when, throughout the world, the improvement in dwelling-houses for man has taken a gigantic stride, while national architecture has declined. The natural qualifica-

tions, and mental acquirements necessary for a professor of this art, numerous and difficult of attainment, have caused the study of Architecture to be ranked among the highest branches of human knowledge; have dignified the excellent among its professors: and have enlisted in its ranks enlightened men from every class of society

An architect should be sufficiently master, in all the arts connected with his profession to judge perfectly of the merit of their productions. This is the most, that should be insisted upon; and, if so qualified, he will not need to blush at his own insufficiency.

It is not to be wondered at, that able architects have always been held in high esteem and honor by the great and powerful. The first Grand Master of the most ancient and powerful organization of men in the world was an architect and builder; and, although a poor widow's son, a co-equal with King Solomon, and Hiram, King of Tyre. The very rules and regulations used by him during the building of King Solomon's Temple are now used by modern masons; and the memory of our first Grand Master, Hiram, is as fresh and green in the breast of every true mason to-day, as if he died but yesterday.

The architects of Greece and Rome were honored. In a letter extant from Theodoric, King of the Goths, to Sym-

machus, his architect, he concludes instructions concerning his palace with observing, that the personal distinction, which he shall confer upon his architect is, that, in all processions and meetings he shall stand next to his royal person, in the centre of a numerous cortege; bearing a wand of gold in his hand; and enjoy other privileges, which should announce the high confidence, with which the King was pleased to honor the architect, to whom he intrusted the building of his royal palace.

It is useless to refer to the ages long since past away, for the origin of the builder's art. The inconveniences of the seasons, the severity of the climate, demanding shelter or shade, compelled men to erect huts with branches of trees and skins of animals. The Indian's hut and the Laplander's cave, of the present day show well enough, from what mean originals it rapidly sprang up to Grecian perfection, without our searching back to the ante-diluvian world, for the origin of its primitive elements.

As necessity was its first parent, so was convenience its first object. Decoration, and magnificence were the results of refinement. Convenience should be the primary view of the architect. Every building is erected, to answer some particular purpose; and the most obvious and simple means are always the best adapted to obtain the end required. After a plan, with all its requisites and purposes, is obtained, the architect is at liberty to add suitable decoration, elegance and grandeur of style, to convenience, strength and propriety; and to finish the whole, with full-blown splendor and grace, which are never to be obtained but by the union of propriety with what is merely ornamental. By this division of the elements of architecture, into utility and beauty, it is obvious, that it is both an art and a science; and that the architect should be both an artist and a philosopher. Inasmuch as it is a useful and a fine art, the first or scientific part of architecture

is mechanical, and may be acquired; the latter, or art, is the result of what is called genius, which, like poetry, is partly innate and difficult to acquire, although, by study and close observation, it may be brought to some degree of perfection. The one requires the aid of imagination and fancy; the other is guided by fixed rules.

To form a complete architect, both must be united; for the necessities of a plan are often misunderstood; and a glaring pile of useless beauty mocks the possessor with a dream of grandeur which he cannot enjoy.

Without science architecture is an effeminate and useless pastime; and without the higher feelings of art, a mere construction of huts and cabins. The true foundation of the architect is Mathematics. Arithmetic is the groundwork of his future operations in Mensuration, either as to extent or solidity. Geometry—which lays down the first principles in construction, adjusts bearings and proportions; and measures, points, angles and solids—is of the last importance. Masonry in brick and stone, carpentry and the inferior mechanical arts must be understood by him with accuracy, and be practised with readiness, as being the executive department of his art. Surveying, leveling, hydrostatics, and other of the mixed and applied sciences are likewise of primary importance to the architect; and must be cultivated, both theoretically and practically. Mechanics is also another indispensable science to the architect, together with sketching and drawing. These various studies are all requisite in forming a complete mechanical architect. But in one, whose duties and high station require him to design, direct and manage great works, to organize and rule numerous bands of workmen and laborers, additional faculties of a very high mental class are requisite.

Convenience, strength and beauty are the principal points to be studied in

building. As to convenience, no general directions can be given, since it must be the emanation of the projector's brain, the arrangement of the building, to suit his purposes, must be contrived according to the uses for which it is erected. Strength is acquired by a just construction; and the fewer materials by which it is obtained, consistent with proportion, the better. Beauty is the key-stone of the fabric, completes the structure, and gives it a determined character.

Magnificence and splendor are excesses of beauty; simplicity is its greatest charm.

The buildings of the Greeks are renowned for their symmetry and proportion; though the style is very simple; while the Romans glory in decoration and gorgeous magnificence; yet both styles possess the character of beauty. Many architects mistake boldness for beauty, and, on the other hand, overloaded ornament for decoration.

It is that nice faculty of comparison and discernment, that is so necessary for an architect to possess, to enable him to steer clear of either the severe or tawdry; and, by distributing the parts, to combine harmony with proportion. It depends, altogether, upon the genius of the architect, as to how he will succeed in his decorations. Ornaments are ill placed, where they may be spared, without being missed; and empty places are absurd, where nakedness is offensive to the eye, and where propriety would dictate or admit of appropriate decoration. All buildings should be composed with regard to the principal part from which they are to be viewed. In fact, nothing but nature, refined by a long study of the best ancient and modern examples, can enrich the mind, and facilitate the hand sufficiently, to excel in this noble art.

Successive ages of mankind have been noted for some superior buildings. The Temple of Apollo, in Delos, was erected 1000 years B. C. The first Temple of

Diana, at Ephesus, burned by Erostratus, was built by Chersiphron, of Ephesus, B. C. 600 years. Demetrius, of Ephesus, B. C. 540 years, continued the building. Paconius, of Ephesus, B. C. 420 years, finished it, the whole requiring about 240 years in its construction. It was the most magnificent temple of ancient times. Anthemius, of Tralles, in Lydia, 550 A. D., constructed the celebrated Church of St. Sophia, at Constantinople. His style was remarkable for grandeur and dignity. Romualdas of France, in 840 A. D., constructed the Cathedral at Rheims, the earliest example of what is called Gothic Architecture. Robert de Covey, of France, rebuilt it in 1280 A. D. William Wykeham of Wykeham, England, in 1350 made the plan of Windsor Castle and the Cathedral of Winchester. Bramante Lazzari—better known by the name of Bramante d'Urbino, of Castel Durante, near Urbino, born 1444, died 1514—first designed and commenced the building of St. Peter's, at Rome, in 1506. Fra Giocondo, of Verona, in conjunction with Raffaele and San Gallo, carrying it on after his death. Michael Angelo formed much of the plan, as it was he that raised the cupola. Maderno finished it in 1621. It is said to cover twenty acres, and to have cost 1,000,000 pounds sterling. Giovanni Battista di Toledo, in 1560, designed the celebrated palace of the Escorial. Sir Christopher Wren, of England, the most celebrated architect of modern times, was the projector and sole constructor of St. Paul's.

All of these men were celebrated architects and builders, in the ages in which they lived, and have left everlasting monuments of their fame. The architecture of the present age is dwarfed, when compared to the massive grandeur of the past. A critic beautifully says, that—

"Nothing, certainly, can be more destructive to the hopes of an enlightened age, of fame among remote posterity, than the decay of an art, whose monuments are so lasting and whose triumphs

are so sure of continuance. Its venerable relics convey to us all we know of mighty nations long sunk into oblivion. Among piles, which seem only to have partaken of the decay, and shared in the revolutions of nature, we feel transported, through long vistas of the short-lived generations of man, into the glories of the earliest nations of the world. We catch the mysterious spirit of patriarchal times; and image to ourselves, among these romantic solitudes, shepherd kings propounding their pure ordinances, simple tribes adoring the God of heaven, and untutored bards catching inspiration, in all its vividness, from the skies. We must leave such memorials of our glory behind us, as can be shaken only with the pyramids of Egypt, and the pillars of the universe."

But, what a contrast do the frail memorials of our times present to those immortal structures! All who feel interested in the substantial progress of the fine arts; all who have feelings to admire the sacred solemnity and the awful grandeur of those venerable piles, which the genius of Egypt, of Greece, of Rome, and of the middle ages have left us, must be deeply interested by a discussion of the means, by which may be revived that spirit, which raised these works of unfading enchantment, and which now seems slumbering beneath them.

And here, in our own glorious America, where the spirit soars aloft free and untrammelled, may that genius awake; and, during this century, revive all the glories of ancient architecture, by engrafting them with our new ideas of utility, and in our own city of Philadelphia may the erection of the new Masonic Temple be the forerunner of a style of grand and magnificent architecture, destined to eclipse all the vastness of the past, and transmit to posterity everlasting monuments of the age in which we live!

The means, whereby we can erect buildings, have been greatly increased

since the times of the ancients and the middle ages. The invention of the steam engine, with the employment of machinery in almost every branch of mechanism, has wrought a complete revolution. We have been accustomed to look upon the Pyramids of Egypt as monuments of skill and labor almost impossible to emulate; but, when it is considered, that the most powerful monarchs of the East lavished the wealth of empires and the lives of thousands of their subjects upon this useless work, our feeling of admiration gives way to that of wonder; and we, practical men of to-day, cannot be impressed with awe; but eagerly search for a solution of the question, How was it done? History tells us, it took thirty years to complete this gigantic work; there were, according to Herodotus 100,000 workmen employed at one time, and relieved every three months; ten years were employed in hewing and conveying the stones, and twenty more in finishing this enormous structure. It is computed to be about 500 feet high, and the length of any one of its sides 700 feet; and to be composed of about 250 layers of stone from two to four feet thick, overlying each other in proportion to their elevation, thus forming gigantic steps, which, with considerable difficulty, can be climbed to the top. The whole of the Egyptian empire, then in the zenith of its glory and magnificence, was made to contribute, by men and means, to the completion of these works; and there they stand, to-day, an everlasting monument of those times. I would say, that there are many men to-day, in New York and Philadelphia, who would contract to build a fac-simile of any one of those celebrated pyramids, according to specification; and not think it such a big job. With all our modern appliances of machinery, the task of lifting immense weights to great heights is comparatively easy. We have solved the problems of mechanics quite satisfactorily. We have advanced rapidly in the im-

provement of the means to build; but we have lost the genius and spirit, that fired the souls of the architects of Greece and Rome; and now—gazing upon the smouldering ashes of the past—we await the moment of inspiration. Is it dawning upon us in this Nineteenth century?

Intending only to have written a short sketch, I find it is impossible to be very brief upon so fertile a subject; and shall continue my remarks in a following number, with some practical ideas, upon Modern House-Building.

BUILDER.

PLACES OF AMUSEMENT.

A TIME there was, when our best Theatres were content to bestow all attention on the interior, without any reference to the exterior. Hence the usage, which so generally prevails, of occupying the street-front with business stores, leaving an entrance to the Theatre between these. In fact, this mode of proceeding, viewed in an economic light, was decidedly advantageous, as it gave all the revenue of rents to the Theatre, as an equivalent for the absence of Architectural frontispiece.

But Architecture is beginning to assert itself in this matter; and we find to-day a rapidly-growing desire to bring fair Thespia to the front. Mr PIKE—a gentleman of taste, enterprise, and public spirit—is foremost amongst the friends of Architecture, having erected a very tasteful structure at Cincinnati, since burnt down, and having just now completed, at New York, an Opera House, which is creditable to his liberality and energy. Tried by the test of Architectural rule, however, we should be inclined to raise some questions, as to the correctness of the building, as a design. We allude now particularly to the exterior.

The two façades (that on Twenty-Third street as well as that on Eighth avenue) are to say the least, commonplace; and most unnecessarily so; for the openings are the only features in either front, if we except the centre on Eighth avenue, where two Corinthian columns are used, the design being Greco-Italian. Triplet windows are intro-

duced at this centre, the windows in the main being square-headed. These are distinguished by being semi-circular; and here the great difficulty exists. Instead of springing the arches over these triplets, on a range with the square heads of the flank windows, the Architect has thought fit to keep the top of the arches aforesaid on that range. The effect is evident. These centre triplet windows, which ought to have been made the feature, by peering up above the square-headed windows on either side, appear to be actually dwarfed instead.

But this is not the only defect to be found in the design in question. The Statuary group, crowning the centre, is entirely too small; and presents a rather insignificant appearance, on a front of such dimensions. And, to add to the meanness of effect, the urns, at either side, are rather too large.

The Mansard Roof looks entirely too blank; and we are somewhat surprised at the Architect's neglecting to introduce windows, or any thing whatever to break up the sameness.

We, of course, find no fault with Mr. Pike, in these remarks; but merely suggest to his Architect some of our own ideas, which may or may not be of value. Perhaps he may differ with us—*Chacun à son goût*.

We offer him, as we do every one, a fair field for the defence of his design; and shall be glad to see him enter upon it, backed by those, who agree with his views. Our chief aim is the dissemination of true principles; and if, in the at-

tainment of our object, we scratch too hard with our critic pen, we have to offer, as apology, the nature of our calling, and the absolute necessity for untrammelled thought in this crusade for truth.

As a place of public amusement, Pike's Opera House will, at no distant day, relinquish its vocation, as it is now sold by Mr. Pike to the Erie Railroad Company, for Eight Hundred and Fifty Thousand (850,000) dollars; but will not be disturbed, for the present season at least.

We trust Mr. Pike will favor the public with yet another temple; and that we may have the pleasure of commending it.

EDWIN BOOTH, in the fulness of his love for his art, has gone nobly to work in the erection of a temple, worthy of its most perfect representations of mimic life. This building fronts on Twenty-Third street; and has likewise an entrance on Sixth avenue. Like its contemporary, Pike's Opera House, it is of marble; but, unlike it, Booth's Theatre is very original in design. Mr. THOMAS is the Architect; and his treatment of this study is certainly striking, we had almost said, in the extreme. But so seldom do our professional brethren ven-

ture beyond the strict bounds of traditional rule, that the darings of Mr. Thomas are refreshing, to say the least. The two doors, of large proportions, which occupy the flanks, are not alone imposing in appearance, but highly suggestive of safety, a very delightful feeling for theatre-goers, who entertain for a moment the thought of a possible conflagration and an instant demand for "the liberty of the subject."

The ornamentation is unique, and agreeable to taste; and were the Architect to enliven his design with as many sculptured figures on this front, as he has on his Park Bank, we would look upon this new Theatre, as a very desirable addition to the Public Places of Amusement, of New York; and, at the same time, regret the fate of dulness, to which the big Academy of Music has been condemned, in its meaningless exterior.

We are led to hope, from what is now being done, that Architecture will ultimately assert its claims to notice, in designs of theatres; and that the external observer will see in the exterior that effect of purpose, which speaks to the eye as perfectly, as the scenic arrangement within, which leads the senses captive.

WATER SUPPLY FOR COUNTRY RESIDENCES.

MR. EDITOR:

I HAVE been for twenty-five years a resident in the country. During the greater part of this period, I have been mainly dependent upon my own resources, for my supply of water, for household and farm purposes.

For a time, I was the fortunate possessor of a farm, with buildings occupying a very elevated position, yet under a slate hill, from which sprung a stream of pure water, at an elevation of more than one hundred feet above my dwelling-house. At the time I purchased, the

water was conducted to the buildings through a two-inch earthen pipe, laid in mortar, for a distance of about eighteen hundred feet. The water descended from the spring above, by force of gravity alone. The earthen pipes were laid through woods, and I had soon to encounter an unexpected difficulty. The roots of the forest trees, which had been cut off in making the trench for the conduit, were, in a short time, attracted by the moisture, and extending themselves under and over the pipes, in the course of their growth, lifted up, or dis-

placed them from their position, thus causing crevices in the mortar, around the joints, through which the fibrous roots grew into the water, where branching out into infinite tendrils, the passage through the pipe became plugged and closed, and the water, instead of running out at the buildings below, burst forth above, at numerous points, so that I was soon forced to replace the earthen pipes with those of lead.

Soon, however, another difficulty presented itself. The water was nearly pure, containing little, if any, impurity, other than atmospheric air. The carbonic acid and oxygen of the air, thus held in solution, in a short time, acting upon the lead, the latter was carried along, partly in solution, and partly in suspension, in the water. As a consequence, not only was the pipe destroyed, but members of the family were poisoned by drinking the lead. Thus showing, that there are other difficulties to contend with, besides getting the water to the house. Of what, then, should the conducting pipe be formed? Leaden pipes, lined with tin, have been proposed, (tin, it being supposed, not containing poisonous or deleterious properties.) My opinion, however, is, that these two metals being in contact, a galvanic action is induced, causing the solution and removal of the tin lining, and thus the exposure of the lead to the further action of the water, with its evil consequences. We have an example of this daily before our eyes, in the tin utensils about our kitchen, as well as on the tin roofs of our houses. These last, if not protected by paint, are soon destroyed.

What, then, should be the material, out of which our water pipes should be constructed? I answer, iron. Iron, it is said, will soon rust. This I admit. But is it not better to sacrifice our dollars, than our health, or even our lives? Iron pipes, however, are manufactured by Messrs. Morris, Tasker & Co., of this city, which are coated with zinc, by a galvanic process, that for a long time

protects them from rust. Neither zinc nor iron have poisonous or deleterious properties. But, on the contrary, are rather promotive of health. These pipes are not costly, and are joined by screws, which any unskilled person may put together, thus saving the enormous plumber's bills attendant upon the use of lead. Let me, then, recommend these galvanized iron pipes, as being far preferable to those of any other material.

When the house is situated *above* the source of water supply, the question will arise, how is it to be best driven to the house? There are two methods now in use. One by means of the pump, the other by means of the hydraulic ram.

The pump may be worked by several methods. When the supply is to be derived from a deep well, an hydraulic ram cannot be used, and a pump coming into requisition, may be worked by hand, by horse, by steam-power, or by a wind-mill. Where a large supply is required, perhaps the Ericson caloric engine will be the most economical for pumping from a well. With this kind of house supply, and a large reservoir, placed in the loft of a barn, or other outhouse, or an adjacent elevation, there will be great certainty.

Where the supply of water is to be derived from a living spring, on the surface, with a fall below the source, and where the supply of water is sufficient, a water wheel will be found efficient, though expensive for a family of ordinary size.

Where economy is an object, avoid machinery; it is expensive at the outset, and expensive afterwards, requiring constant repairs and renewal. All pumps involve the necessity of machinery, whether moved by hand, by horse, by the wind, or by steam.

The most economical machine of all others, according to my experience, is the *HYDRAULIC RAM*. I admit, that when improperly placed, as is most generally the case, and not protected from extra-

neous influences, an hydraulic ram is a nuisance.

When scientifically placed, (there is science in this,) and properly protected, it is the very best, and from first to last, the cheapest of all other modes of forcing water. When not so placed, it is the most bothersome.

In 1859, an hydraulic ram was placed by me, under the direction of Mr. Joseph Strode, of West Chester, for the supply of my house, now the property of Willis P. Hazzard, Esq., of Sansom street, which, with a fall of about eleven feet, drives more than one gallon per minute, night and day, to the reservoir and seventy feet high. This little machine might be called a perpetual motion, with a cost of not ten dollars for a period of nine years. Mr. Strode is a mathematician, and a man of science. He has made hydraulics his study for many years, and is the inventor and patentee of a method of placing the driving-pipe of the hydraulic ram. The *cycloid curve*, it is well known, is the line of quickest descent, for a body traveling by its own gravity, between two points, one above the other, which are not in a vertical line. Mr. Strode places the driving pipe, from the spring to the ram, on this curve, *laid with mathematical precision*. It is with pleasure I refer to Mr. Strode, whose patent is based, not upon quackery, but upon science.

But use what pipe you will, and lay your driving pipe on the cycloid curve, too, your ram will not answer expectations, or promises, unless, at the same time, proper care is used to confine the supply of water so securely, that it can only escape from the spring-head through the driving pipe. How is this to be done? I answer, first, dig out around the spring-head all the mud, until you can see from whence the water issues. Having done this, inclose it with a tight wall of stone. Around the exterior of this wall dig a trench, about three feet wide, and down to the very bottom of

the well, which has been dug around the spring. Fill this trench with *clean, heavy sand*, free from stones and sticks. As the sand is placed, it must be rammed well, so as to be perfectly solid. The bank of earth, on the outside of the sand trench, must be packed well up against it, so as to keep the sand solidly together. This thoroughly done, the well will be found perfectly and *permanently* water tight, and impervious to crabs, water rats, and every other living creature. Care must be taken, that the driving-pipe, in its passage through the wall, is well cemented, so as to be water tight, and that the sand is well packed around this pipe also. In building the wall around the well, bear in mind, that it will be necessary to have a pipe of large calibre, built in the wall, also water tight, at the bottom of the well, so that it can be emptied out, to be cleaned. This can be best stopped with a plug. The driving pipe must be provided with a strainer, to exclude motes of every kind, as well as frogs, &c.

These points having been attended to, it will be necessary to cover the well with a roof, and a door, which should be fastened with a proper lock.

Let us now go down to the ram, which should also be provided with a house, to protect it from all extraneous influences. Necessarily, these little machines are to be placed in wells, in wet and springy places; they should, therefore, be constructed so as to be water proof. Nothing should have either entrance or exit from a ram-house, but what is necessary for its proper play. It should be built with a brick floor, laid in hydraulic cement, and built up of brick and cement, from the foundation to a point, two feet at least, above the surface of the ground. The driving pipe, and the supply pipe, should be cemented in the wall. The waste water should be carried out at the bottom, through large pipe, of about four inches diameter, laid so that the *lower end*, or exit, shall be twelve or twenty-four inches above the

ground. Thus the water will flow out as a fountain; and frogs and other living creatures cannot enter. I have known a ram to be stopped, by a collection of frogs getting together in the waste pipe, laid on the level of the creek below. These cold-blooded animals, on a cold winter day, had gone into the (to them) warm spring water, to escape from the cold, perhaps hibernating. An old fellow, of a pound weight, being in the centre, and more than a dozen little fellows huddled together around him. These, thus impacted, had formed a tight valve, shutting in the flow, and submerging my ram with three feet of water.

This ram-house should be covered, and closed with a suitable lock also. Much trouble will be saved, by furnishing the driving pipe with a full-sized stop-cock, near its lower end, and also one for the supply pipe. Then, should the ram require attention, the water can be shut off from the spring-head, without the necessity of going there, to remove the strainer, and insert a plug. The stop-cock at the supply pipe running to

the house, will, when closed, save the loss of the water in it. It is well, too, when starting the ram, to have these pipes full of water.

I would recommend the "Douglass Ram," as the best in its plan and arrangements for adjustment, of all others. It is, however, faulty in its structure. The flange of the air chamber is too small, and the eight-sided little *thin* nuts are difficult to manage, and soon wear out. Many other parts of it are too light. The manufacturers of these machines should bear in mind, that they are for use in places remote from shops, and by persons, who, for the most part, are not mechanics. They should, for this reason, be perfect and strong in their construction, and easily put together and taken apart.

I have found, that country plumbers understand this water supply better than city men. They are more at command, have more ingenuity, and render smaller bills.

EXPERIENCE.

November 30, 1868.

OUR STREET ARCHITECTURE.

OUR cities, unlike those of Europe, are wholly devoid of antiquarian memories, so that we are not called upon to embalm their legends in stone or brick. Without having a lesson, then, to convey, we find ourselves at perfect liberty to adopt that mode of street architecture, which is most consonant to taste, untrammelled by necessity.

In the cities of Europe there is invariably some ancient church, or monastery, whose venerable remains are held too sacred to be removed. Around such, the street architecture must be in keeping with this old monitor, that presides over the locality; and hence the necessity for renewing in the present

the quaint forms of the past. That there is much picturesqueness of effect, in many of those modern street compositions of Europe, no one will deny. But all such are referable to the one parent idea—the old monumental example in the midst.

Here in our new land, with our un-historic cities, we may build our streets, to meet our wants; and suit their various styles to the motley tastes of our divers owners of houses. Yet, in all this independence of design, we see an evident desire, on the part of our citizens, throughout the great nation, to produce something in the way of elegant art. If critics will not acknowledge our success in making that desire evident in

our street-fronts, it is because they are not disposed to credit the will for the deed.

Our English friends are rather disposed to be hypercritical in this matter; and deserve to be taken to task, at times, for undeserved severity. It is not our intention to defend palpable faults on the part of our designers; but we must exclaim against the too constant fault-finding of a people, whose own architecture is so open to objections, which we never utter. For instance, even the *London Builder*, usually disposed to be lenient to our errors of judgment, spoke in one of its leaders of "the American tricky use of wood as a means of embellishment." Now, no people in the world have more to answer for in the "tricky" sense than the English builders. The most palatial terraces of the fashionable West End of London are but mockeries. The Hon. Horace Greeley, in a visit some years since to the mammoth metropolis, was so struck with the grand appearance of one of these terraces, (Carlton, we believe,) that he wrote home a glowing description of its splendid effect, the whole being executed in *stone*, giving it an appearance of *solidity* which added to its grandeur! Poor Mr. Greeley was decidedly "tricked." The truth is, the whole thing was but a sham! a *composition of plaster on lath*! And of such are the most of those grand compilations of London street architecture.

Now, if we Americans in the ignorance of our comparative youth, are guilty of reprehensible trickery in wooden embellishments, it is because our buildings are types of our country, whose staple national material is *wood*. Stucco, cement, or plaster of any kind, is not in itself, a material at all, but a mere composition of materials. So that the expression "tricky" is most decidedly more applicable to our elder cousin than to us.

But, let all that pass. We are not disposed to deal in unkindnesses. Our

present object is to review our position in STREET ARCHITECTURE.

In every city of the Union this subject is one of very great and growing interest to-day. Notwithstanding the unprecedented rise in materials and labor of every description, the desire of all our citizens is to emulate each other, in the laudable effort to make our business and dwelling fronts, not alone attractive, but tastefully elegant; and thus render our cities remarkable for their street architecture.

That we cannot expect any thing like a coincidence of taste, we are aware; for, in such a great diversity of ideas, it is impossible to form any thing approaching a unity of effect. Yet, if architects will but act together, for the general good, always provided, moreover, as the lawyers have it, that the proprietors, their patrons, will permit them, there can be little difficulty in arriving at a general tasteful conclusion. Unfortunately, there exists in every community an obstinate ambition to excel a neighbor. One man builds his house of a certain proportionate height, with openings to match. His neighbor builds his higher, and also increases the height of the openings, so as to dwarf the next door concern as much as possible, without the slightest regard to proportion. Sometimes an overweening ambition will in this way lead a man up two stories higher than good sense would permit him to go; and the consequence is that our street architecture is thus ruined for those buildings. In all our cities we meet this inequality of height, style, proportion, and taste; and the eye is constantly offended with the horrid apparition of blank brick side-walls, rising high above the neighboring roofs, and holding, in their grim and apparently slender grasp, the florid front of most pretentious stone or iron.

When we take into consideration the narrow frontage of business houses, on the best commercial streets of all our cities, it becomes a matter of necessity,

that, for the sake of appearance at least, three or four fronts should combine to form a frontispiece, in which proportion could be preserved, and, if possible *unity of style*. But, so loth are some persons to relinquish their cherished whims, that they would sacrifice propriety of taste, and common sense itself, to the carrying out of the pet idea. Such people there is no way of controlling: they are lords of their own domain; and it is not in the spirit of our free and liberal government to compel them to hearken to reason, and not perpetrate a crime against the character of our street architecture.

We have more than once seen a florid Gothic front of eighteen or twenty feet in length, and from seventy to eighty feet high, with crocketed pinnacles and traceried embatlements, and all the other accessories of hoods, corbels, &c., filched from some mammoth cathedral, and crammed into this long, slim front, which slips up, in gawky showiness, to the astonished clouds! And this fripperied attenuity is rendered still more absurd, by the glaring contrast it makes with the fronts it out-tops. The architect is surely to be pitied, who is compelled to yield to the unreasoning client, that insists on such an *elevation*. Money will carry out such follies; and, were one professional man to refuse being made instrumental in the perpetration of this public wrong, there would, unfortunately, be found others, less conscientious, whose motto would seem to be, "Obey orders."

We are of the hopeful opinion, however, that property owners are not altogether callous to criticism; neither are they deaf (as a class) to the appeals of taste; and that they possess as much of the pride of locality as others do, we believe; so that such a state of affairs is far from hopeless; but rather to be considered well within the range of attainable things; and that it lies in the power of the public press to place the question always in its true light

before the eyes of those, who possess this inherent right to build tastefully or otherwise, so that editors owe a *duty* to the community in this matter, which, as good citizens, they should not repudiate.

There is one unfavorable feature in the street architecture of all cities; and that is, the buildings being so invariably governed by the drill-sergeant idea—'dress up on the front.' In other words, there are no broken surfaces. For instance, the Ledger building in this city the Metropolitan Hotel, New York, and numberless other instances, throughout the country, present one tiresome straight line of front, which, if broken into masses with projections of only three feet, or say two even, could be made to present a most interesting façade. The stores might be injured, in a business point of view, by such treatment; and perhaps, therefore, it would be as well to confine it to the superstructure.

What a fine appearance some of those long fronts offer under a skilful architect; and what a relief to the way-farer, whose eye is sorely tired with the monotony of brick surfaces of interminable length, broken only, if at all, by the change of material, in the whole lengths of streets, *ad infinitum*.

It is true, that sometimes a Church appears, like a blessed suggestive friend, to relieve the dulness of continuity, which so oppresses us; but, alas! the dollar demon of commerce has too often witched this oasis away, and filled its venerated place with a block like unto the rest of the desert of sameness.

To exemplify our meaning—let an artist undertake to give perspective views of our streets, and what a patch-work thing he must necessarily make of it! How utterly devoid of variety of shade tints those relieving beauties of a picture. How higgledy-piggledy the styles, and how unmeaning the whole collection. Here a Greco-Italian squeezes, to the right and left, its plainer neighbors of less pretensions; and, anon, a

Gothic spirit is displayed in some quarters, to the detriment of the more pleasing Grecian or Norman fronts, that have the misfortune to be contiguous. Cornice butts on cornice, no matter how diverse the styles. Nor does this objection create so much dissatisfaction, as that of having the numerous cornices at as many heights, and no two of them on line. A similar dissatisfaction arises from the belts and string-courses, which have no affinity whatever for their neighbors.

Painting is another source of discontent with our street architecture, as now existing. One man paints his premises; and his neighbor lets his go without painting. Now this presents, at times, quite a ridiculous appearance; the one half of a dividing column, where two houses belong to one block, looks bright and fresh, with its new coat; while the other half looks dirtier than it is, on account of the contrast. So with the cornice, belt-course, &c.

In a new country, like this, architects, employed to design new streets, would do well to consider the subject of two sets of stores, one above another. The upper tier, as well as the superstructure, to be set back, the width of a sidewalk, from the front of the first story floors, such upper sidewalk to form the covering, or roof, of the front part of the store beneath it. Winding stairs at the corners of streets would lead to the second tier of stores. This plan was once proposed in London, but, in such a city, the expense of carrying it into effect would be enormous. In our country, where new cities are to be built, it might be found to answer. One of its advantages would be the facility for shopping, it would give females. All the stores most suiting their wants being on the second story, such, for instance, as shoemakers, dressmakers, milliners, jewelers, &c., &c.

The offices, on the story over this, would certainly be more free from street noise, than at present; and, the street,

being necessarily wider, would have much better light. Moreover, the ladies and children would, on the upper sidewalk, be free from the disagreeable encounters with hand-carts, splashing wheels, and fear of restive or runaway horses; not to speak of the occasional crazy bull, or indomitable pig, that will so terrify, if not upset them.

Certainly—by this or some other bold innovation—our street architecture stands much in need of the mental efforts of our professional brethren; and it is most fervently to be hoped, that, when the idea once comes forth, no niggardly spirit may be found to crush it out, by landlord power, or other shortsighted policy.

Above all things, let our street architecture preserve alignment, as far as the height of the houses is concerned; and that where there are several houses in one block, the front be broken into centre and wings, or in whatever manner best suits the taste of the designer. But, in all cases, let a certain unity of feeling be preserved with the buildings around; that is, let the harmony of the whole be aided by not introducing a discord in the midst.

Our street architecture in many cities, especially New York, is too apt to present glaring colored stone fronts, on which the most artistic work of the chisel is partially lost, owing to the whiteness, and consequent want of tint in the stone. Moreover the brightness of marble, while new, is very hurtful to the sight, and gives some people a head-ache. To be sure, these objections fade out with the effects of time and weather on that material.

In conclusion, we would urge professional brothers to give us their views on this all-important subject, that it may be thoroughly investigated. Those of our readers who are not architects, may also have a thought to spare upon this subject, and we shall be glad to hear from them, when on another occasion we again review it.

PLAIN AND ENCAUSTIC TILES, FOR FLOORS.

THE want of materials for floors, combining beauty and durability with facility for variation in the pattern, has long been felt by all engaged in building; and attempts have been made, from time to time, to meet this; but none with any successful termination, until the manufacture of Encaustic Tiles was originated.

The Romans had their mosaic pavements, which very probably first gave rise to the subsequent discovery of these tiles, by the endeavors which were made to imitate them, by means of colored substances inlaid upon stone or marble. Some few examples of this description of stone "marquetry" remain to this day, in a tolerable state of preservation, in Canterbury Cathedral, England, and also in one or two of the old churches and cathedrals of France, as the Abbey Church of St. Denis, and the Cathedral of St. Omer.

That this was extensively adopted, and gradually modified and changed, until it by degrees led into the discovery of Encaustic Tiles, we have ample proofs, in the many specimens, which are to be seen both in England and France, the most elaborate of which is that of the Prior's Chapel, built in A. D. 1321, by Prior John De Crauden.

In all these, however, the tiles were of a single color; but so combined, as to form a poly-chromatic pavement, in regular geometrical designs; sometimes presenting great variety of form and size.

It was not before the Thirteenth century, that the manufacture of tiles with more than one color was commenced; and it flourished, for the subsequent three centuries, with considerable success. One of the earliest and most perfect specimens is that of the Chapter-House at Westminster, which was long known, by report, to antiquaries; but

only laid open to view, a few years ago; when the tiles, each of which bore a particular device, were found to exhibit as brilliant colors as when first laid down; the sizes varying from about six to ten inches square. At other places, in England, similar specimens of this mosaic pavement have been met with. Towards the close of the last century, much interest was excited, among antiquaries, by the discovery of one at Caen, in Normandy, of which the following brief description, from the London Builder, may prove of some advantage to our readers:

'The separate tiles, composing this "mosaic pavement, were supposed to be "emblazoned with the heraldic bearings "of the barons, who accompanied William of Normandy to England. The "pavement is supposed to have belonged "to a building forming part of a Convent, or Abbey, built by William; and "to have covered the floor of a hall "measuring one hundred and fifty feet "by ninety. The tiles were about five "inches square, made of baked earth. "Eight rows of tiles, running from east "to west, bore the arms of William's "followers; and between these were "ornamental compartments of tiles, "formed so curiously into a maze or "labyrinth, that it is said the windings "of the lines forming the device in each "compartment extended to a mile in "length. Notwithstanding that these "rooms were used as granaries, for upwards of four hundred years, neither "the damp of the wheat, the turning "and shifting of the grain, nor the "wooden shoes and spades of the peasants, constantly employed in bringing "in and cleansing the wheat, have in "the least damaged the floor, or worn "off the painting from the tiles."

These tessellated pavements fell into disuse, from about the period we have

referred to, viz., the Sixteenth century; and the modern manufacture may therefore be looked upon as a revival, similar to that of stained glass, with some decided improvements in an ancient art. The credit of this has been attributed to Messrs. Minton & Co., of Stoke-upon-Trent, England; and great commendation is justly due to these gentlemen, for the liberal spirit with which they have endeavored to restore, in its primitive beauty, this once-flourishing system of decoration. The example they set has had a beneficial influence in advancing the manufacture, by stimulating others to show what could be done, and by directing public attention to the novelty and its many useful applications. At the present time, this branch of art is one of very considerable importance; and in great demand, not only for ecclesiastical buildings, but for domestic architecture.

In England, the employment of these tiles, for flooring purposes, has been in force these many years, for churches, royal and noble mansions, club-houses, and other public and private buildings. In the new Houses of Parliament, in London, where durability and beauty of design and effect were the points aimed at without any regard to expense, it was used to a very large extent, and has been found, after the test of several years, to have proved most successful in places exposed to the greatest wear and tear.

Only comparatively at a very recent date, the introduction of this material has been appreciated by our countrymen; and it is now coming rapidly into very general favor, as an elegant, tasteful, and, at the same time, economical substitute, for the different descriptions, that have been in use hitherto.

Previous to the application of these tiles in our architecture, we were, perforce, obliged to use marble, as a material for floors; and although the marble-cutters, at a great expense and labor, varied the shape of their black and white

tiles, still the effect produced by these did not vary much from the common chequers; and owners of private dwellings, after wainscoting their halls, and painting walls and ceilings, were compelled to use perishable oilcloth for their halls and vestibules, or else, marble tiles of a pattern common to bar-rooms, theatres, and halls.

The encaustic tiles, which are now available, and in great request for the purpose, are composed of materials so hard, that they may be said to be indestructible: the colors are as durable as the material, and will not stain with acids, or any other agents. It is not even possible to scratch, or disfigure the face of these tiles with the hardest wear; and when once put down, they will last for centuries. Hence it is not exaggeration, when we pronounce them to be the most economical material, that has ever yet been discovered for flooring purposes; and, at the same time, they are perfectly fire-proof.

They can be procured in infinite variety and color, each tile being composed of three or four colors, by which means a most chaste and beautiful effect is obtained in their use for vestibules, libraries, public halls, &c. They are peculiarly suitable for churches, giving a richness of decoration, which has not been customary, during the last few centuries; and—there being patterns intended exclusively for ecclesiastical purposes—they can be made, by a judicious selection and adaptation, to harmonize with any style, in which the edifice itself may be constructed.

It is, indeed, almost an act of supererogation on our part to say much more regarding the manifold advantages which Plain and Encaustic Tiles possess over any other material, so widely appreciated and extensively known have they become, of late years, in the United States.

The moderate cost at which they can be laid down, their great durability, and their decorative fitness for every style

of building, are fast rendering them an indispensable feature in every instance, where any pretensions to architectural beauty or style, are aimed at. The price of the plain tiles is lower than that of marble; and that of the more ornamented description, although at the first a little higher, still, when we consider their indestructibility, durability, and the variety of the designs, is comparatively cheaper, by far, than marble.

The colors of the plain or cheaper tiles, are composed of red, black, buff, blue, chocolate, and green; and, by means of a judicious combination of these, a great and pleasing variety of patterns can be formed.

The size of each tile is six inches square, or octagon six inches diameter, filled in with squares of two inches each.

Their uniform size allows them to be packed in a very small space; twelve square feet making one square foot solid; and weighing one hundred and twenty-five pounds. These have been used for a great number of churches, as well as public halls, custom-houses, banks, hotels, stores, halls, vestibules and conservatories, and have uniformly given entire satisfaction.

Their extremely low cost places them within the reach of the great mass of our people; and the demand for such an inexpensive and at the same time beautiful and durable decorative material for the flooring of our edifices is steadily increasing.

The diversity of patterns, in which they are procurable, renders it practicable for individuals to select those most suitable to their own taste, to the style of the building, and purpose of the flooring space for which they are required. We will give a short description of the two different kinds, the plain and the inlaid tiles, which are manufactured and imported in large quantities from Messrs. Minton, Hollins & Co.'s works, in Staffordshire, England, for which S. A. HARRISON, Esq., of 1010 Chestnut street, Philadelphia, is the

Agent in the United States, and to whom we are indebted for much valuable information on the subject.

The plain tiles are of various sizes, from half an inch to six inches across, and each is of one color, extending entirely through the whole substance, and with perfect uniformity of tint. They are of two thicknesses, half an inch and one inch; the former being considered strong enough for any purposes, except paving warehouses. The shapes are geometric, as squares, hexagons, octagons, and their parts, so that an almost endless variety of changes can be made in the arrangement of the figures.

The inlaid tiles are rectangular, one inch thick, generally six inches square, and it is to these that the term "Encaustic" is applied, arising, as the meaning of the term itself, "burnt-in," will suggest, from the peculiar manner of their manufacture.

The plain tiles are formed by the compression of an amalgamation of alumina, silex, and barytes, with some suitable metallic oxide for coloring matter, into metal dies of any geometrical form, that may be desired; after being taken out of these dies, they undergo the process of "firing" in kilns; and here great care is necessary, as well as in the composition of the substances of which they are formed, in order that the necessary process of semi-vitrification may not be carried so far as the point of vitrification, as, should such be done, the surface of the tiles would be rendered so slippery, as to make them unfit for paving purposes. Where, however, these tiles are designed, as they occasionally are, for the ornamentation of walls, the process can be continued until the desired amount of glazing is obtained.

The manufacture of Encaustic Tiles is somewhat more complicated, and has been brought to its present state of perfection, only after years of unremitting perseverance, repeated failures, and large expenditure of capital. The first step is the digging and grinding the

clay, which is used just as dug out of the natural soil. This is mixed with water, and ground until it is thoroughly incorporated, and brought to the consistency of cream. It is then strained through sieves of fine silk lawn, so as to remove the smallest earthy impurities, and allowed to rest, until whatever earthy matter yet remains subsides to the bottom of whatever vessel in which it is placed. After this, the water that may be in the mass is drawn off, and the moisture got rid of by evaporation, until it becomes of a soft, plastic character, capable of being moulded into any desired forms. In this state, this plastic clay is pressed into an embossed plaster-of-paris mould, the pattern or design on

it having a raised surface, and the colored figures, ornamentation, or letterings, as the case may be, remaining hollow. The squares being thus prepared, material of the same component parts, reduced to the consistency of cream, and colored with the desired oxides, is carefully poured into the interstices, or indentations. The surface is then scraped quite flat, and all irregularities removed, until the pattern appears to be distinct, and as perfect as when designed. It then undergoes the process of firing, in which, as we have before said, the utmost caution and skill—only attainable from long experience and practice—are requisite, in order to determine the exact limit to which it shall be carried.

HOSPITAL CONSTRUCTION.

IT is an unaccountable fact, that, for centuries past, and up to a very recent day, the progressive course of science did not take in the crying necessities of hospital construction. Mortality was fearful and almost unheeded. Suffering humanity dreaded the ordeal of these pest-houses, falsely styled hospitals; and many a constitution, that went in slightly disordered, came out, if it escaped at all, completely broken.

This misery was chiefly owing to the want of proper ventilation, as well as of room. In fact, in days, happily now gone by, the subject of ventilation, even in hospitals, was but very little known, and still less practised. Not that there were no fine buildings erected, but that they were few, and those few very defective, in a sanitary point of view.

War, in our day, has called out a great deal of scientific experiment in hospital construction. Such was the case in the Russian, or War of the Crimea, the war in Italy, and our own four years of conflict in this country. But, the military hospitals temporarily erected, at that

time, were peculiar to the occasion; and, having ground to any extent for sites, possessed an advantage, in the matter of ventilation, which is unattainable in large cities, where lots are limited in extent and unlimited in price. It is with these latter, we have now to deal; and, looking to the permanent location of our city hospitals, we must deal with their construction accordingly.

Concentration of control is a very desirable point to be obtained, in all hospitals; and that means neither more nor less, than the so centralizing the department of doctors, nurses, apothecary, &c., as to be equally ready for calls from any side. The cooking department should be also governed by the same necessity.

Narrowness of corridors should be carefully avoided. Every thing should be liberal—breadth, height, and accommodation generally. In no case should the mere architectural effect of the exterior be permitted to interfere with the arrangement of the interior, and especially not with the dimensions of the

windows, light being as necessary to health as is ventilation.

Staircases should be wide, with a double return; and the stair-chamber should be so arranged, as to shut out effectually all noise from the wards.

Dumb-waiters and lifts should abound and one of the latter, centrally located, be provided, for the easy conveyance of the sick, from the first floor to that where their appointed ward is to be.

The site is, however, the prime idea to be kept in view. It must be out of the way of all malaria, and on as elevated a position as circumstances will admit of. Ample space must be secured, as cities are so apt to become crowded, that the structure, which has been erected in an originally open and very airy location, as in the case of the New York City Hospital, is but too apt to be crowded up, to a degree depriving it of its sanitary character, and inducing the necessity of its removal.

Ample grounds should always surround hospitals, so as to perfectly insulate the building, in all future time; and not alone merely insulate it, but keep it completely out of the possible propinquity of unwholesome influences.

As to the interior arrangements, or "cutting up," as it is technically termed, we will not presume to dictate to our professional brethren, that being their peculiar care, in the case of designing such works. We would, however, urge the avoidance of the doctrine of economy, where its introduction might militate against the interest of sanitary science. On this point, Dr. John Jones, the medical adviser of Washington, in the days of the Revolution, writes:—

"A false economy has universally prevailed in the structure of hospitals for the sick; for those that have hitherto had a principal direction, both in the architecture and management of them, have confined their views entirely to objects of conveniency, cheapness, and ornament.

"In short," he says, "the physician and architect have, generally, two very

opposite and incompatible views; the latter laying out his plan, so as to contain the greatest number of persons in the least possible space; whereas the former always aims at having the utmost room, which is consistent with use and convenience."

We hope, that the remarks of the doctor do not apply in our day in any case. We know that, in our great cities, the designs in general, and the details in particular, are keenly criticised; so that our hospital structures are as near to perfection as the existing knowledge of the requirements of such institutions will admit.

BRICKMAKING IN AUSTRIA.—One of the most remarkable brick manufactories in any country is that of Alois Miesbach, in the Austrian dominions; or, rather, there are several belonging to the same person. He sent over an assortment of bricks, draining-tiles, roofing-tiles, and hollow-bricks made by machinery to the Great Exhibition in London; and the following account was then given of his manufacturing enterprises. He has seven establishments in various parts of Austria and Hungary, giving direct employment to 4,880 persons. His brick manufactory at Inzersdorf, on the Wienen Berg, is said to be the largest in the world. It covers an area of 265 English acres; while 680 acres of clay land have also been purchased, in order to secure excellent materials for a long period. There are drying sheds, 24,930 feet in aggregate length, for ordinary bricks; moulding sheds 8,304 feet long for tiles and ornamental bricks; 446 moulding benches, 43 kilns capable of burning 3,510,000 bricks at one time, 5 Artesian wells, washing and kneading pits, blacksmith and carpenter shops, and tool shops. There are employed in this one manufactory 2,890 persons, and 300 horses. The establishment also comprises schools for the children, dwellings for the workmen, a hospital, and public kitchens.

MANUFACTURES REVIEWED.

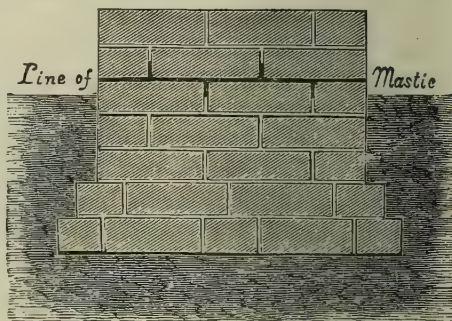
FOREIGN.

IT is pleasing to know, that our REVIEW meets with a warm recognition in the Motherland, as is most practically shown in the letters from England and Ireland, with reference to advertising with us, by some of the leading manufacturers. This is as it should be. The Telegraph has cabled together the great countries, hitherto so distantly related to each other; and now we can chat, with pleasant fluency, as though we were next neighbors. The products of each continent are transmitted, from shore to shore, in the same time that it took, some years ago, to transport goods over one-tenth of the distance on land. Let the reciprocity of national skill be fostered; and the interchange of ideas be free, for our mutual advantage. The pages of the REVIEW are open to the use of our European, as well as our American friends, and we shall welcome both, with equal warmth.

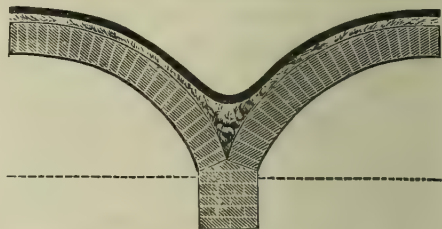
THE SEYSSSEL ASPHALTE COMPANY, 5 Parliament Street, S. W. London, is in the full tide of successful operation; and has executed numerous highly creditable works, of which we may name Windsor Castle, Buckingham Palace, Guy's Hospital, Woolwich Barracks, and the prison at Holloway.

This remarkable material, so well known in England as *Pyrimont Seyssel Asphalte*, was established as far back as the year 1838; and bore the trade title of "Claridge's Patent." It is used for foundations, terraces, sidewalks, platforms, flooring, roofing, cisterns, &c. We would claim the attention of our professional men for its many merits: the chief of which is the perfect prevention of damp in walls and cellars. There is no more trying subject to the architect, than these present; and we are sure a material, that has stood the

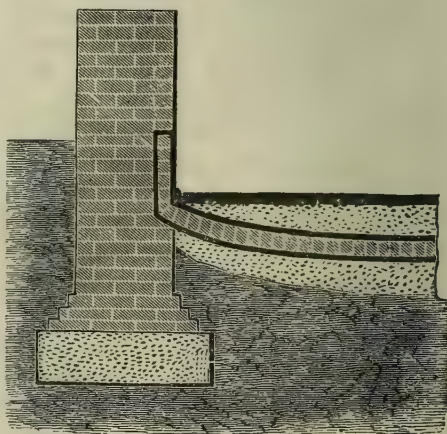
severe test of so many years, cannot but be desirable, on this side of the Atlantic. The manner in which it is used is highly suggestive of its perfect utility, as a preventive of wall-damp, as may be noted in the following illustrations:—



And again, we see its advantages



clearly indicated in this cut:—



We will conclude this notice with an interesting extract from the letter of a practical man:—"In 1839, I superintended the construction of a house of three stories on the *Lac d'Enghien*.

The foundation of the building is constantly in water, about $19\frac{1}{2}$ inches below the level of the ground floor. The entire horizontal surface of the external and internal walls was covered, at the level of the internal ground floor, with a layer of Seyssel Asphalte, half an inch thick, over which sand was spread. Since the above date, no trace of damp has shown itself round the walls of the lower story, which are for the most part painted in oil of a grey stone color. It is well known that the least moisture produces round spots, darker or lighter, on walls so painted; yet the pavement of the floor, resting on the soil itself, is only about $2\frac{1}{2}$ inches above the external surface of the wall, and only $19\frac{1}{2}$ inches, at the utmost, above that of the sheet of water. The layer of Asphalte having been *broken and removed*, for the purpose of inserting the sills of two doors, spots indicating the presence of damp have been since remarked, at the base of the door posts."

ANN STREET IRON WORKS, BELFAST, IRELAND.—We are favored with a beautifully illustrated quarto pamphlet of Patent Stable Fittings, Patent Iron Cow-House Fittings, and general work executed at the above establishment of MUSGRAVE BROTHERS. The number of merit-medals bestowed from time to time on these gentlemen, for the exceeding excellence of many of their productions, is a proof that their claim on us for notice is unquestionable. On this side of the Atlantic, we have not hitherto bestowed all that attention on the sanitary housing of our horses, we ought; partly because the higher bloods were not so much cared for, as that class of the equine race is in the *old country*; and partly, and perhaps chiefly, because our citizens were too engrossed in the making of money, to bestow attention on the rapidest mode of spending it. However, we have been altogether behind the times, in the comforts of the Stable; and would therefore urge the

necessity for a thorough revision of our system, which is, we trust, not yet too *stable* to be reformed.

HOME.

AMERICAN VENTILATION COMPANY.—

When the late Professor Espy patented his ventilator, many years ago, we thought that the "ken" of science could no farther go. But, here is Griffith's Patent Archimedeian Screw Ventilator and Smoke Conductor, which is far more effective, more durable and less liable to go out of order.

This simple, yet complete Ventilator, consists of an Archimedeian Screw, suspended within a cylinder, centered upon an imperishable substance, moving without noise, and surmounted by a rotary head, which is so delicately hung, that the least breath of air will cause it to revolve. The screw within the cylinder, revolving with almost inconceivable rapidity, acts as a pump, exhausting the air from the flue, thereby creating a tendency to vacuum, which must be filled from below. This simple explanation will show to all that in a chimney or ventilation flue, topped by one of these ventilators, a draught is a necessary effect.



PERMANENT LIQUID GLUE.—A good fluid glue, ready at all times for instant use, without any preliminary preparation, is one of the most useful articles of stock, with which the workshop of any mechanic can be furnished. To make such a glue, all that is necessary is to melt three pounds of glue in a quart of water; and then drop in, gradually, a small quantity of nitric acid. When this ingredient is added, the mixture is to be removed from the fire and allowed to cool. Glue so prepared has been kept, in an open bottle, for two years; and has always been found ready for use on the instant, not deteriorated in the least.

INLAID WORK.—How pretty and how varied are the different kinds of inlaid work! and how much they facilitate the employment of small fragments of materials! There is the *Marquetrie*, or inlaid cabinet furniture, of France, consisting in inlaying woods of a great variety of tints, in the form of flowers, ornaments, &c. There is the *Buhl*, or Boul work, also of French invention, wherein metals are inlaid, upon a ground of ebony or tortoise-shell. There are the elaborate German cabinets, made of ebony, inlaid with precious stones and various woods and metals. There is the *Mosaic inlay*, in which the pieces inlaid are extremely small, and of which exquisite boxes are made in the East Indies; witness, also, the marvellous Spanish table (which was to be seen at the Great Exhibition at London) in three million of pieces. There is the *Parquetrie*, or inlaid flower-ing, which differs from Marquetrie chiefly in the bolder scale of the designs; woods of different colors being cut to pattern, and inlaid. There is the novel and beautiful process of inlaying articles of

furniture with porcelain: the inlaid portions are not merely panels and pilasters, but painted porcelain flowers and other ornaments. There is the *Pietra Dura*, or *Florentine Mosaic*, a kind of art carried to great perfection in Tuscany; its cultivation in that country, for a long period, supplied most of the palaces of Europe with works in *pietra dura*, which rank among the finest examples of decorative furniture. This process consists of certain kinds of hard stone—such as agate, jasper, chalcedony, cornelian, and lapis lazuli—inlaid in a slab of marble, generally black. The marble is worked to a thickness, not much exceeding an eighth of an inch; and the design is drawn upon it, and is cut out with a fine saw and a file. The hard stones, worked into a required pattern by the ordinary methods of gem-cutting, are accurately fitted into the spaces thus prepared, in a polished and finished state. After the whole is thus prepared, it is fixed as a veneer, to a thicker slab, and is ready for mounting or framing, according to size.

REVIEW OF NEW BOOKS.

THE CARPENTER AND JOINER. BY ROBERT RIDDELL. A revised edition of this work, illustrated with 34 plates, is just fresh from the press; and the Publishers, CLAXTON, REMSEN & HAFELFINGER, have kindly furnished us with an early copy. There is a very great want of fitting books of instruction for Carpenters and Joiners in this country; and, in consequence, our students are compelled to have recourse to *Nicholson*, although that work, so excellent at one time, is growing rapidly out of date. The treatise, now under consideration, is well calculated to aid in filling up the deficiency. What we want at this day is not English but American books. Our system of Joinery, and indeed our modes of Framing, are in a great measure *sui generis*. It is necessary, therefore, to give the beginner every opportunity of storing his mind with all the requisite information, which may help to lead his mind on to the easy understanding, and entire control, of all branches of his scientific art. On the subject of Stair-Building, Mr. Riddell is very clear, and extremely useful to the practical man; and we feel confident, that his lessons, in this department alone, will prove a very desirable matter, indeed, to the class for whose benefit they are so admirably designed. Mr. Riddell's book is inductive,

beginning with the very initial outlines, and leading, carefully and comprehensively, on to the most difficult problems, with which the mind of the joiner has to grapple. The work is all we could desire; and we claim for it the patronage of our American carpenters and builders. It is profusely and most usefully illustrated on excellent paper; and, in fact, gotten up in a style well adapted to its purpose. The enterprising young firm, who have given it to the public, deserve the success their venture is certain to meet with.

THE DISEASES OF SHEEP: WITH AN ESSAY ON CATTLE EPIDEMICS. By Henry Clok, V. S. 1 vol. 8 vo. pp. 146. Philadelphia, CLAXTON, REMSEN & HAFELFINGER, 1858. We have no doubt, that this little brochure will prove of very great usefulness to a large class of our readers, being free from lengthy dissertations, which only tend to render the subject tedious, and being the production of one thoroughly and practically conversant with the matter he has handled. Every thing he has related is the result of his own experience and observation; and nothing is—as too often is the case with similar works—the product of philosophical reasoning, or hypothetical theories. We recommend it to all who are interested in the subject.

THE
ARCHITECTURAL REVIEW
AND
AMERICAN
BUILDERS' JOURNAL.

VOL. I.—Entered according to Act of Congress, in the year 1868, by Samuel Sloan, in the Clerk's Office of the District Court of the United States, in and for the Eastern District of Pennsylvania.

MONTHLY REVIEW.

THE MINSTERS OF ENGLAND.

NEXT to Canterbury, in the ecclesiastical rank of precedence, but equal in historical interest, stands that veteran of Christianity in England,

THE CATHEDRAL CHURCH OF YORK.

The city of *Eboracum*, or YORK, was a place of importance, amongst the Britons, two thousand years ago, when the invasion of Julius Cæsar gave their "tight little island" to the Romans, to have and to hold; under whose guardianship York became a place of still greater importance, as being the capital of that section, which bordered on the land of the Caledonians.

The See of YORK contended, through long ages, with that of CANTERBURY, for the ecclesiastical precedence; and this contest was one, at times, of great asperity. It was decided, in favor of the latter, during the reign of William the Conqueror, although, for a considerable time after that decision, the See of York continued to urge its claims.

The history of the great Cathedral is that of many a mighty structure, having its origin in a very unpretending form of temple. Edwin, the Saxon king of Northumbria, was a pious prince, who had married the daughter of Ethelbert, the first of those kings who embraced

Christianity; and was thereby induced himself to become a Christian. Edwin was publicly baptised at York, on East-erday, April 12th, 627. A small oratory of wood was hastily constructed for the purpose. This little shelter was soon followed, and enclosed, by a larger and more permanent building of stone, which occupied the site of the present Minster. Here were people of that section, then called Northumbria, now Northumberland, admitted to be baptised and abjure the pagan idolatry in which they had been reared. From that auspicious day, we trace the growing Minster, amid all its vicissitudes of fire, reformation, and plunder. At times almost annihilated—then more grandly built—to be again doomed to destruction, yet in part preserved, to be more and more magnificent still; until twelve hundred and thirty-one years have passed, to find it in our day a wonder of art, among the Christian temples of the present.

Edwin was not destined to finish the pious work he had begun, he being, like another great founder (Romulus) slain, ere yet his conceptions were developed.

As a specimen of Ecclesiastical Architecture, there is nothing in England can at all compare with the truly magnifi-

cent Cathedral of York, whether viewed in the light of beauty or size. All writers are agreed, as to its grandeur of general effect, as well as its elegance of detailed feature. Some other English Cathedrals can show details of exquisite beauty: some can boast of majesty of design: but none can compare, in all things, with the perfectly beautiful York Minster.

At a distance, it presents to the eye of the spectator a lofty and most imposing aspect. Its three towers are distinct objects, rising, in massive grandeur, above the houses of the city and the parochial churches; and, with the impressive gables and ornate pinnacles, furnish the eye a subject worth studying.

York Cathedral has several unfavorable circumstances to contend with, such as the flatness of site, the unfavorableness of approaches, &c. The houses are built near the church, on the east, west, and south, where the entrances are, being so close, as to present quite a crowded and unpleasing appearance; the spectator being necessarily too close to obtain a fair view—all the parts appearing distorted or abrupt. The higher members are seen, by the rules of perspective, as vanishing, or dipping, too quickly to be pleasing; and the nearer parts seem awkwardly large. Thus, the positive beauties of this structure are warped into deformities by this disadvantageous situation of its surroundings, just as an individual of unblemished character may appear unfavorably, when found in the midst of low company.

This beautiful Minster may be regarded, as very regular and uniform in arrangement and style of architecture. It consists of a nave with its two aisles, a transept with two aisles and a lanthorn in the centre, a choir and lady-chapel, with two aisles, vestries or chapels on the south side, and a chapter-room with a vestibule on the north side. The peculiarities and styles of these parts, as well as of the exterior, will be here explained:—

The situation of the magnificent *West Front* is such as to be most unfavorable for the display of its beauty. A wall and some small houses confine it in a narrow area. This grand front cannot be viewed, except in a diagonal direction. Two uniform towers, strengthened at their corners with buttresses, which diminish at four divisions, as they ascend, rise from the western ends of the aisles of the nave. Between these towers, the front of the middle aisle is carried up to the same height as its side walls; and an open battlement runs across the whole breadth, round the towers; and continues along the sides of the nave. Almost the whole of the front is covered with a number of niches, adorned with a beautiful variety and richness of sculpture, wrought in each of the buttresses, as well as in the walls between them.

In this *West Front* is a window of truly magnificent proportions, with leafy tracery of exquisite grace; marking the style of the fourteenth century. A crocketed pediment, in the form of an isosceles triangle, encloses and surmounts the arched head of this window, the apex of which rises above the battlement, and is executed in open tracery, through which is seen the gable of the roof, richly adorned with tracery mouldings, crowned at top with open battlements, highly ornamented and raking, on both sides, up to a tabernacle on the summit. The centre entrance door has a similar pediment crowning it. This doorway is divided into two parts, by a slender pillar. Each part, or passage, is covered with enriched arches, the space between them and the outer arch being filled with a handsome rose-window.

The lower parts of the towers preserve a correspondent design to the sides of the fabric. In front of each is a window exactly like the rest in the aisles, only not brought so low at bottom, to make room for the doors. The form of the western towers—from the open bat-

tlement that surrounds them, at the height of the nave—is very simple. A window on each side is the principal feature. The canopy of each window, it may be observed, exhibits a change of style from the lower windows, the lines not being carried to a straight angle, but curved, to suit the shape of the arch, which is high-pitched.

The double buttresses at each angle diminish in three breaks, elegantly finished with crockets, &c., but cease under the cornice, which runs entirely round the tower, even at the angles. Above this cornice rise eight lofty square pinnacles, and a battlement of similar design to that below, but loftier and more elaborate. The walls of the upper portion of the towers are beautifully adorned with niches, pinnacles, gables, and other ornaments.

Nave: Exterior. The nave is divided into seven parts, by buttresses; and consists, as usual, of the two stories. On the north side it is finished, in a plain style; the aisle having no pinnacles over its broad and massive buttresses. The once lofty pinnacles of the south aisle have suffered severely from time. The entablatures on which the battlements stand, have an enrichment of finials, peculiar to this structure.

On the north side, near the west end, is a staircase in the buttress, also a small arch or two of very ancient style. In the angle, between the north transept and the nave, the ruinous effect of the deep settlement of the great tower may be traced, though the most unsightly blemishes have been removed or concealed. Part of the transept was, by this settlement, crushed down nine inches; and the nave was brought down almost as much.

The Tudor style is very evident in the central tower. On each of its four sides are two large windows, having two tiers of mullions, bounded on each side by compartmented buttresses. The battlements are richly perforated in masonic compartments. This tower was never

completely finished, as an indication of an arch meets the eye, which sets all architectural conjecture at defiance.

The *South Transept* was completed about the year 1227, early in the reign of Henry III. This superb elevation is divided by buttresses into three parts, corresponding with the division of the interior into three aisles. In the central compartment is the porch, which is approached by a spacious double-flight of steps. On each side are two windows, and above it, three large lights occupy the whole of the central compartment. Over these is the great circular window, which forms the noblest decoration of this transept. It consists of two concentric circles of small columns and trefoil, the centre and spandrels of which are pierced.

The four octangular turrets are certainly more modern, than the date of the transept; and the centre pinnacle has been brought from some other part of the building. The sides of this transept are divided into bays, by buttresses similar to the front; in each bay are two windows, separated by a slender buttress. The early date of the erection of this transept is shown in its pointed arches, and slender pillars with plain or slightly ornamented capitals, its narrow and acutely-pointed windows, destitute of mullions, (except in the central window,) and its angular pediments.

The Exterior of the *North Transept* exhibits the finished neatness and plainness of the first period of the pointed style. The aisles have two lancet lights, in each bay, divided by slender buttresses, neatly canted off at the angles and with mouldings. The upper story has a continued series of small arches, three in each bay being pierced for windows. The five long single lights in the north end have a bold and striking effect: under them runs a series of arches, with trefoil heads.

The *Exterior of the Choir* displays some striking features and peculiarities. On each side is a projection, above the

aisles, called the Little Transept, with a lofty window rising from the middle of the aisle to nearly the top roof of the choir, and with side windows over the aisles. East of these the clerestory windows are inserted in the inner part of the wall, and an open screen is constructed before them. This, in England, is peculiar to the present church; but a similar feature prevails in some of the ecclesiastical constructions on the Continent. The great eastern window has a similar screen of mullions and tracery, internally.

The east end of the building is extremely beautiful. Four very lofty pinnacles, rising from the buttresses, form the chief outline; they are finished with an open crown, or coronet, out of which rise the crocketed spires.

Over the centre and aisles are open-work parapets, which run horizontally; and are of different patterns. In the centre is a square turret, not very graceful, which appears to have been built merely to support the finial, &c., of the great eastern window. The spires, at the corners of the aisles, are rather too slender, for a beautiful proportion; and their crockets want boldness.

The great window in the centre has a lofty arch, over which is a fine, sweeping ogee moulding, with foliage canopy, remarkable for its fine curve and lofty termination. The buttresses are adorned by niches, with pedestals and canopies, which were formerly filled with several statues, three of which remain. These appear to represent the figure of an archbishop, seated, holding a church in his left hand, and his right hand raised; much larger than life. A statue of Vavasour is in tolerable preservation; it has a belt, a short doublet, and hose or boots drawn above its knees, but no mantle; the countenance is that of an elderly man. Another statue, which seems to have been a graceful figure, now reduced by the weather to a ragged appearance, is said to represent Percy: he wears a mail gorget and mantle; his

helmet, on which stands a lion (his crest), is on the top of the niche; and a lion, or dog, is at his feet. These two figures hold in their right hands samples of their benefactions to the church. All the older parts of this end are most lamentably mouldering away. The open tracery of the parapets is reduced to a skeleton; and all the crockets and projecting grotesques are mere shapeless pieces of crumbling stone.

From the top of the chapter-house, we have a most complete view of the north side of the choir. The canopies of the aisle windows are here carved to the shapes of the arches; the buttresses do not run up into such tall pinnacles, as those on the south side of the nave, and they have neither statues nor niches. The upper windows do not stand so deeply recessed in the walls, which gives them a flat look. No arched or flying buttresses have ever existed in this part. The form of the four upper windows, east of the Little Transept, is partly concealed by a series of open tracery, over which the parapet is carried; the exterior appearance of this is rather intricate than beautiful; but the effect produced within, by subduing the sidelights for the more brilliant display of the great eastern window, sufficiently evinces the reason and skill of this design.

The windows nearest the great tower, here, as well as in the nave, are somewhat contracted in breadth, and the farthest bay towards the east is also narrower than the rest; the reason of this latter irregularity is not very apparent.

Having thus—with the efficient aid of those critical authors, we have from time to time taken hints from—brought our investigation of this wonderful work, as regards its exterior, to a close, we will take a glance at *The Interior*. The early pointed style prevails in the architectural form and proportions of the *Transept*. Clustered detached columns, with bands; bases with deep and bold

members, and capitals, richly and fancifully sculptured; arches with acute and with obtuse heads, also some nearly semi-circular are all seen. Irregularity and discordance are rather too prevalent, to be pleasant to the eye, in this part of the interior. But, without the necessary illustrations, we would find it a difficult matter to convey our ideas to our REVIEW readers; and will, therefore, spare their patience.

The transepts at the northern and southern extremities are quite dissimilar. The elevation of that on the north side presents five tall lancet windows, called the five sisters.

The reader will doubtless recall the pretty story entitled *The Five Sisters of York*, by Charles Dickens. Whether that delightful delineator of human nature derived his data from a traditional source, or a mental suggestion, we know not; but, the name is suggestive enough; and, as no other reason for it is known to the antiquaries of our day, we will accept it, as the legendary chronicle of the five windows, we now look upon. Above the "Sisters" are five other lancet windows of varied heights, the upper parts of which rise above the vaulted roof. Beneath the sills of the lower windows is a series of blank arches, with trefoil heads. At the northeast corner of this transept is the entrance to the chapter-house, the doorway of which is of singular form and ornament. Through the eastern wall is another doorway, which is supposed to have led to an older chapter-house than the present. The capitals of the columns, the brackets, the mouldings of arches, the bosses, &c., of this part of the transept, are all enriched with bold and elaborate sculpture.

The connection of the south transept with the tower, the nave, and the choir, shows much alteration.

The Nave: On entering this part of the mighty structure, from the west end, the vastness of its dimensions produces an imposing and even an awful effect;

and the mildly glowing lights, which its "storied windows" diffuse, tinge every part with a delightful warmth. The simplicity of its principal lines soon strikes the eye of the spectator. The pillars are remarkably plain; and consist of three-quarter shafts, or columns, alternately larger and smaller, attached to a solid pier; part of these rise up quite to the springing of the groined roof, whilst the remainder support the vaulting of the aisles, and the principal side arches. The bases and capitals are very simple, and rather flat; the latter are, however, wrought in sharp foliage.

Above each of the principal arches, which are all highly pointed, is a spacious window, of five lights in breadth. Between this and the arch is an open triforium of unusual formation. It consists of five openings, between mullions, with trefoil heads and acute pediments. In the centre opening was a statue.

The aisles display a grandeur unequalled in this kingdom, possessing the loftiness of those of Westminster without the narrowness of that beautiful structure. The windows have a striking resemblance to those of Westminster, only enlarged to three lights in breadth, and the arched heads enriched with three quatre-foils instead of one. The wall, below the windows is adorned by paneling and tracery, with light crocketed gables, divided by corresponding pinnacles.

As we advance up the nave, the interior of the great tower, or lantern, is gradually developed. The vastness of the clustered piers, that bear aloft the arches, is managed so happily, as to confine the view to the most admirable parts. The gorgeous front of the olden rood-loft, immediately before us, is peopled by several figures of the ancient sovereigns. The arched roof of the choir appears to great advantage in the distance, and makes us regret, that the perspective should be interrupted by the case of the organ.

Nothing finer, than the interior of the lantern, could be imagined. The gallery is at once elegant and simple, the windows of a size sufficient to fill the whole interior with a brilliant light, just adorned with a small quantity of colored glass, to prevent a glaring effect.

Between the nave and the choir is a splendid *Stone Screen*, which now sustains the organ. It is, as a work of art, truly magnificent. Its parts are everywhere charged with rich ornaments; and the variety and intricacy of its complicated members is as much a matter of wonder as delight. Near its centre is an arched doorway of entrance to the choir, the exterior moulding of which assumes the ogee shape and terminates with a richly sculptured finial. The whole screen consists of a series of fifteen compartments of niches, with corresponding pedestals, canopies, and statues, from William the Conqueror down to Henry V. They are of the natural size, dressed in their ancient regal costumes, enriched with singular ornaments, and all in high preservation.

After passing through this screen, we are introduced to the *Choir*, which is grand in scale and rich in adornment. On each side is a series of twenty stalls, with twelve at the west end, beneath the organ. These are of oak; and are particularly rich in their canopies and carved decorations. Each seat, or stall, has its movable misericordia, with projecting rests for the elbows, from which rise two detached slender columns supporting an elaborate canopy. The *Cathedra*, or *Archbishop's Throne*, stands on the south side and the pulpit opposite to it. At the eastern end of the choir is the altar-table, raised above the regular floor, by a series of fifteen steps. Behind it is a handsome screen, with mullions, tracery, a parapet, &c. Its open dayes, or lights, are filled with plate glass, which affords a view of the elegant eastern window.

On the north side of the altar—over the grated window, that lights the crypt

—is an ancient gallery, to which there is an ascent by a flight of narrow stairs, formed of solid blocks of oak. The exterior of this gallery is very neat; and it is certainly older than the Reformation. A little bow-window, in the north side, gives a complete view into the aisle; and, opposite to it, is a very small loop-hole, in the stone wall, which affords a view into the room behind the high altar. It had also a door into that room. The floor, in which is a strong trap-door, is boarded.

Behind the stalls of the choir are closets, some of which are used as vestries by the singing men; modern stair-cases have been constructed, leading to the galleries erected above, which disfigure the view into the aisles.

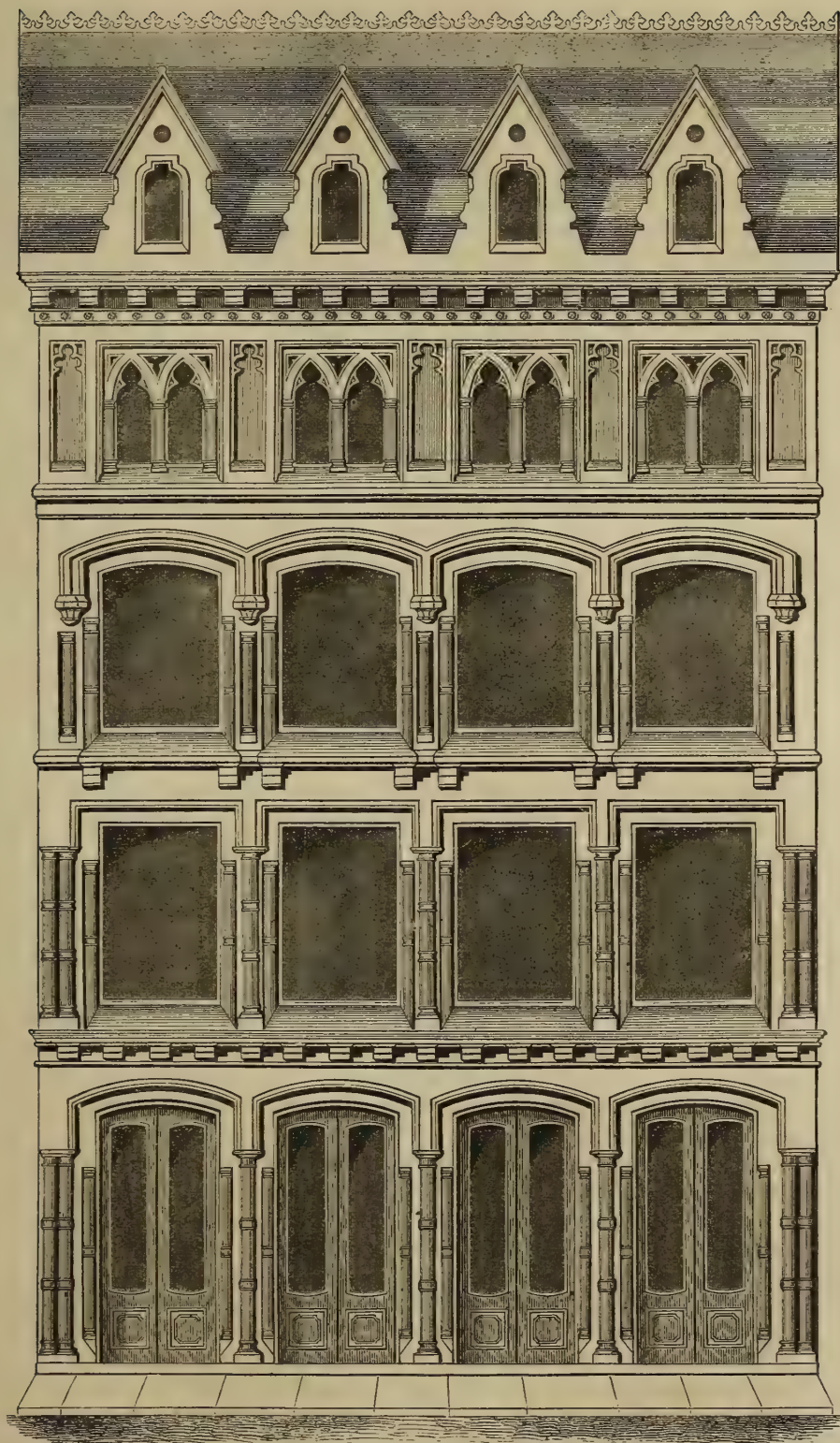
There were anciently three altars in the choir: *St. Stephen's*, *Our Lady's*, and the *High Altar* in the centre. On each side of the latter was a doorway to the apartment, between the screens, where the archbishop used, on solemn festivals, to put on some of his robes; and which, here as in other places, was sometimes improperly styled the "*Sanctum Sanctorum*."

The roof of the choir is of a loftier pitch, than that of the nave, and is actually higher by some feet. The ribs are also more numerous; and cross each other in angular compartments. East of the altar-screen is a large open space, occupied by various monuments.

The walls in the aisles are paneled with mouldings, which partly correspond with the windows. Niches fill up the spaces between the windows and pilasters.

The splendid east window may be said to vie with that at the west end of the nave, in its architectural design and glazed enrichment. Its height and breadth nearly correspond with the space of the choir; and the number of historical subjects on the glass amounts to nearly two hundred.

The design of the great east window is at once very fine and simple. Three



CITY STORE MEDIÆVAL GOTHIC.

chief divisions are formed by two large mullions; and each division is again separated into three lights, whilst all the upper part, from the springing of the arch, is fitted into compartments, half the breadth of the principal lights.

On the south side of the choir are three chapels or vestries; the first of these is paved with small tiles, some of which show traces of painting.

Beneath the altar is a small crypt, entered, by eight steps, from the aisles of the choir; and four more steps descend into the body of it. This crypt has four aisles, from east to west, each of three arches, supported by short columns: the sweep of the arches, on the eastern side, is cut off by the solid

part of the foundation of the altar-screen.

In this very cursory view of the great Minster of YORK, we have endeavored to display its leading features, as we did in the inspection of CANTERBURY; and, in concluding, we cannot but regret that England's other great Minster, LINCOLN, cannot yet have a share in our special notice. Not that it deserves less than its beautiful compeers; but that our space will not permit us to do justice to it at present.

America can never expect to rear such stupendous monuments of ecclesiastical power. We are satisfied to admire them, as mighty works of art; but not to bear them as a burthen of ages of endurance.

DESCRIPTIONS.

STORE: MEDLEVAL-GOTHIC.

IN further continuation of our purpose, expressed in previous numbers, to give, from time to time, various designs calculated for City Stores, and Dwellings of different styles and dimensions, in the present number we exhibit one for a Store Front, which has been designed in the MEDLEVAL-GOTHIC style.

The structure, as will be perceived, consists of four stories, with an attic within the roof.

On the first or ground story, there are four entrance doors with lights of plate glass, all having light, segment-headed hoods over the openings, supported by light, rusticated Gothic columns. These doors, thus arranged, are well adapted for the requirements of a large wholesale establishment, and form a prominent feature in the external design.

The second story windows are all equally large; and have square hoods. In the third story they are segment-headed, with heavy segment hoods, terminating in ornamented corbels. Di-

viding the third and fourth stories is a string-belt with zig-zag or Saxon ornamentation. On the fourth story there are four twin-windows, mullioned, with pointed and cusped heads. Above this story is a dentiled cornice, with a rosetted string-course. In the Mansard roof, there are four dormer windows, in the Tudor style.

We will not attempt any more lengthened remarks, upon the present design; but, leaving it to the judgment of our readers, will add a few notes on a subject, which is intimately connected with the internal arrangement and comfort, not to mention the sanitary condition of our stores, and other public as well as private buildings, that is:—

AIDS TO VENTILATION.

ALTHOUGH we are now fully alive to the fact, that an impure and unventilated atmosphere is one of the most prolific and certain sources of discomfort and disease, and the subject of ventilation is one, that is, at the present time, receiving the most serious consideration

of all scientific men, there is another source of disease—concerning which there is unaccountable popular ignorance and apathy—equally deserving our attention. We allude to the use of gas, without sufficient ventilation. This has just the same effect, in rendering the atmosphere of apartments impure and poisonous, as overcrowding.

The evil of overcrowding arises, as we are all aware, from the fact, that where a large number of individuals are crowded together, in a small space, they consume the oxygen of the air, and poison it with carbonic acid gas. Now, it has been proved by the celebrated Dr. Lankester, Sanitary Commissioner, in his Sanitary Report (St. James', Westminster, London, 1864-5,) that *one gas-light consumes as much oxygen, and gives out as much carbonic acid, as five human beings.*

We have only to bear this in mind; and when we reflect upon the reckless and extravagant manner in which gas is burnt in our stores, factories, workshops, churches, theatres, sitting-rooms and bed-rooms, already too often overcrowded, we cannot be surprised at the inevitable results, which necessarily result from such a process of slow poisoning. We cannot be wrong in assuming, that a large amount of the mortality in our population, is attributable to the evils resulting from exposure to this influence, evils which are not, perhaps, felt at once; but which too surely and insidiously undermine the constitution.

To avert such evils, and yet employ gas, a very useful invention has just been introduced in London. The arrangement of the fittings is novel and effective. Its purpose is to make the hitherto pernicious combustion a means of ventilation, not alone purifying the atmosphere, but securing a supply of fresh air. The invention, we allude to, is of the nature of a globe-lamp, provided with tubes and brackets of such dimensions, as to carry off, through them, the vitiated air from the burner,

and convey it, by means of metal pipes, to the chimney, or into a shaft specially prepared for the purpose. This inner pipe is surrounded by an outer pipe, which carries off the heated air of the room; for by means of the heat of the inner pipe, a constant upward current is created, and a continuous system of ventilation produced, without any fear of draught or smoke. Provision is also



made for the supply of external fresh air, so that the whole arrangement is as perfect and complete as possible. Houses in course of erection may have the ventilation pipes, &c., so arranged, during the process of the work, that the gas may be used in every part of the entire

building, without any injurious vapor whatever escaping from any of the burners.

Thus it will be seen, that the inventor's Ventilating Globe-Light renders the burning of gas, hitherto, as we have before shown, one of the most fruitful causes of the impurity of the atmosphere of apartments, one of the most efficient means of ventilation. The very heat it produces while burning, being made not only to carry off the impure carbonic

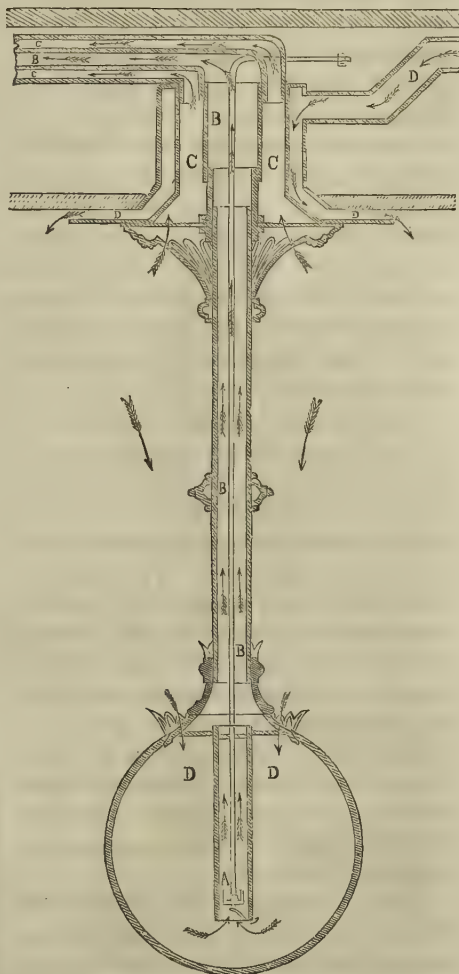


acid gas, ammonia, and sulphuretted hydrogen, which it engenders—and which has been hitherto allowed freely to escape unchecked and poison the air—but also to create a current, for the introduction of fresh and pure air.

DESCRIPTION OF THE VENTILATING GLOBE-LIGHT.

This section shows the working of the system to be, as follows:—

As soon as the burner is lighted, an upward current is created, in the inner tube; this becomes heated, and rarifies the air in the larger or outer tube. The air in both pipes is conveyed to the chimney of the room, in which the Pendant is fixed, thus producing two



distinct actions, viz., the entire removal of the carbonic acid gas, and other products, from the burner, and also a gentle movement of the heated and vitiated air of the room, to the chimney of the

apartment, or to a shaft specially prepared for the purpose.

A is the Burner and Gas-pipe to supply the same.

BB, Pipe to carry off the foul air from the burner.

CC, Pipe to carry off the heated air of the room.

DD, Inlet for cold external fresh air.

The arrows show the direction of the current of air, when in operation. The Pipe D is used to introduce a current of cool external air, to supply the place of that which is carried off by the hot-air pipes, and also to assist in producing a perfect combustion of the flame, when the gas is burning.

It is not necessary to remove the globe, in order to light the gas, as a spirit-torch is used for this purpose; and, by means of this, all charred fragments inside the globe are entirely avoided. The Globe is not fixed, but simply rests upon the holder, so that it can be readily removed for cleaning, when required.

LEHIGH UNIVERSITY,

BETHLEHEM, PA.

THE accompanying Illustration exhibits the design for the LEHIGH UNIVERSITY, at BETHLEHEM, PA., the Architect of which is Mr. Edward Tuckerman Potter, New York, to whose kindness we are indebted for the following description of the Plate.

This University was founded by the Hon. Asa Packer, of Mauch Chunk, Pennsylvania, who has endowed the building with the munificent sum of half a million dollars.

The College Buildings are in the Pointed style, and front two hundred and eleven (211) feet, with a depth of sixty-two (62) feet, and are three stories high, with a mansard roof.

The walls are of the local quarry work, with dressings of blue lime stone and sand stone.

The building embraces a Polytechnic

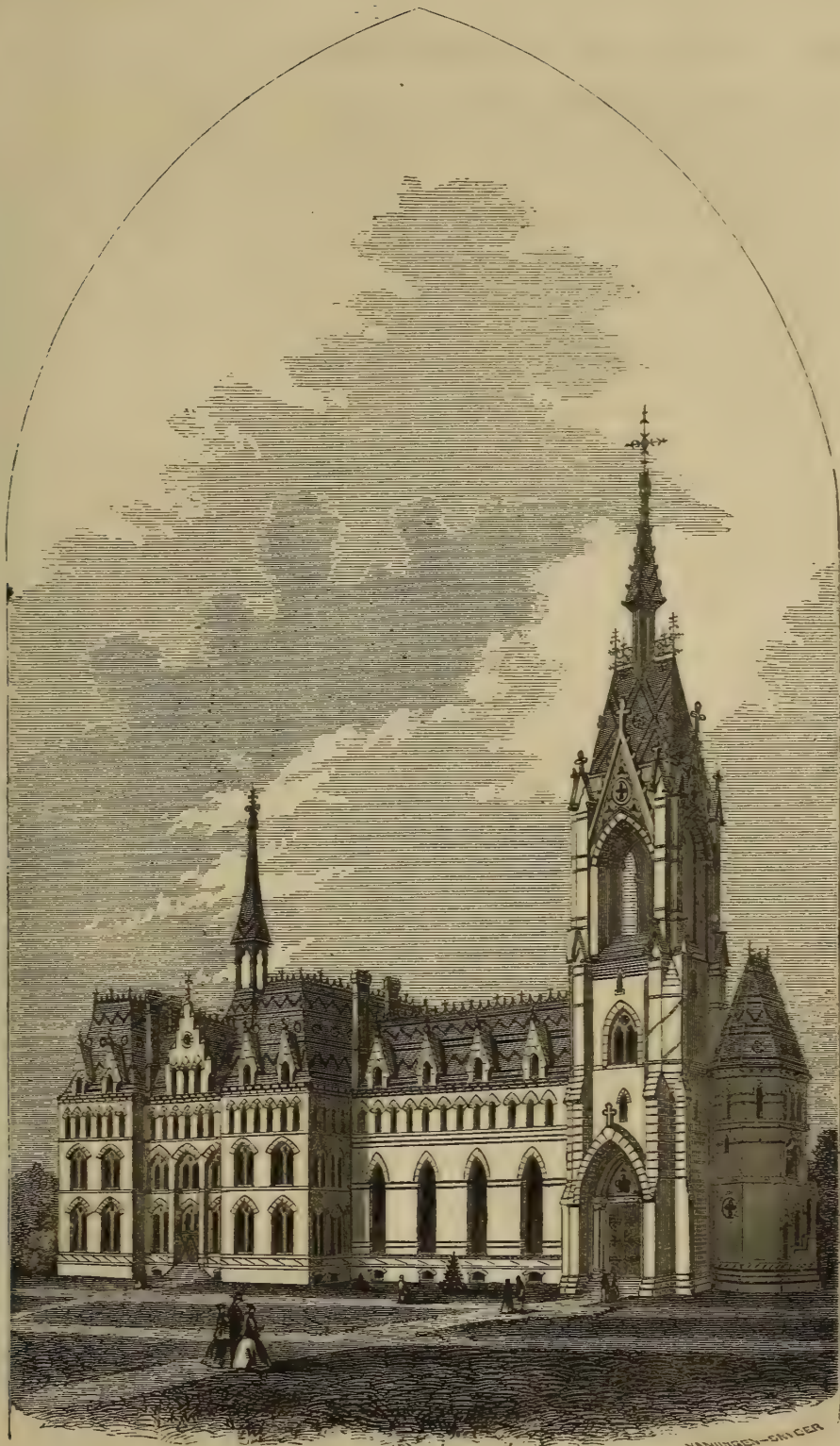
Museum and Library, arranged with alcoves, for the exhibition of specimens of all materials used in the arts, from their native state (as ores, &c.) in every stage, up to the most highly finished articles made from them, with plates illustrating every detail of the work, models of the apparatus used, and all the latest books treating of the same. The whole is systematically arranged, so that the student may, at a glance, glean the leading facts on any subject; and may, with the most economical use of his time, make himself master of that subject. The whole under the charge of a Curator, is always open to those students, who prefer to pursue their studies there.

The Building also embraces a Chemical Department, with Analytical Laboratories, Lecture rooms, &c., with all the modern improvements; a spacious and admirably lighted Engineering and Draughting department; and also ample accommodation for the Departments of Natural Philosophy, Languages, Belles Lettres, &c. There is also a large Chapel, forty (40) feet by eighty (80) feet, with open timber roof, and stained glass windows. Besides, there are numerous other apartments for the College Registry, fire-proof Chambers, &c.

The main entrance is through a massive Tower, thirty (30) feet square at the base, including buttresses, and one hundred and twenty-three (123) feet high, to the top of the tower, and one hundred and seventy-one (171) feet to the top of the finial.

The entrance is adorned with columns and carved archivolt. The bases of the four columns are carved with the earliest fossiliferous forms known, succeeded by those of a later, but prehistoric age; while above the capitals are carved with laurels and bays, enwreathing scrolls, bearing the names, on either side, of the greatest poets, scientists, philosophers, &c., which History records.

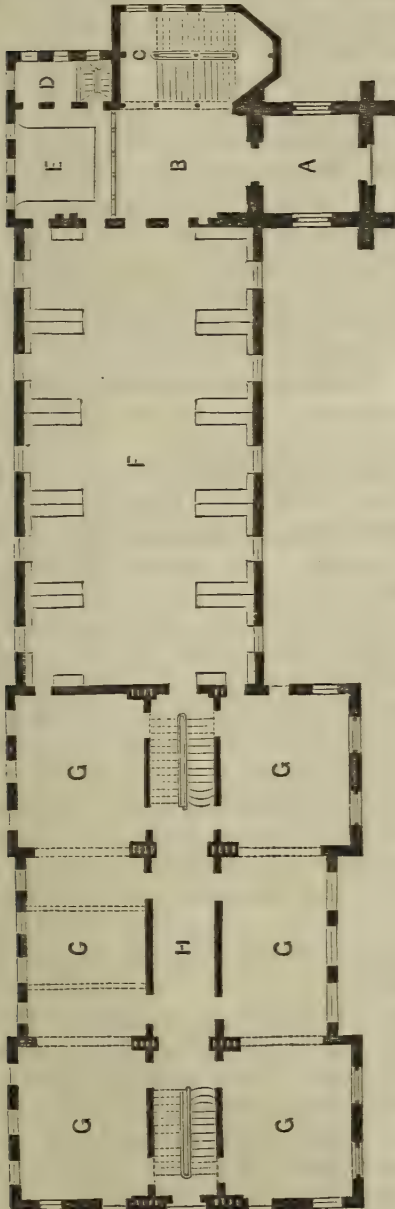
The Archivolt connecting the capitals, bears on a band of foliage the text from Bacon, "Homer minister et interpres Na-



LEHIGH UNIVERSITY: BETHLEHEM, PENNSYLVANIA.

ARCHITECT, EDWARD TUCKERMAN POTTER, NEW YORK CITY.

turæ." Directly over the portal is inscribed the sign of the microcosin. The tympanum of the arch is filled with stone tracery, enclosing a tablet of polished red Aberdeen granite, recording the use



of the edifice, the time of its erection, and the name of its founder.

The Entrance Chamber, and the Hall beyond, in which is the grand staircase,

are spacious and lofty, lined with stone, and lighted with stained glass windows, filled with the figures of the great inventors, who have first shown how the results of science may be applied to the benefit of their race.

The building stands upon a terrace, on the side of a Hill, and rises out of a grove of fine forest trees.

The design also embraces in the same style, the President's House, a spacious Mansion lately erected, and other buildings now or hereafter to be put up.

The following brief description of the Ground Plan, and the references thereon, will give our readers a clear idea of the internal arrangement and ample accommodation provided: A is the main entrance or vestibule, leading into the main hall B, which contains the grand staircase C; from the Main Hall, two doors lead into the Library and Museum F, with an office and Registrar's Room D attached. Passing through the Library another Hall H is entered, off which are doors communicating with six Lecture Rooms G, G, G, G, G, G, three on either side, each group of which is capable of being thrown open into one large Lecture Room the whole length of the three Rooms, whenever such an arrangement is necessary

ELIZABETHAN VILLA.

WE have already, in these pages, adverted briefly to the Tudor style of architecture; and noticed the gradual blending together of the Castellated and the more domestic features, which characterized the fifteenth century.

About the time of Henry VIII. the domestic style of architecture had fairly settled down into what is called the Tudor, an admixture of the Castellated with the Gothic; and many really very striking and picturesque examples are to this day to be met with, in England, of mansions built in the irregular but strikingly effective manner, which char-

acterizes that style. In them are to be seen all that mixing together of turrets, gables, bulbous domes, elaborate brick chimney-shafts, and overhanging oriel-windows, which are its most prominent characteristics.

At the earliest part of this century, when the blending of the Castellated and the Gothic first naturally came about—as the result of the cessation of the “Wars of the Roses,” and a general desire, among the nobles, to consult more the convenience and grandeur of their dwellings, and less the principles of security and defence—the style was termed Tudor. But later, the admixture of the Tudor details with Italian features, which took place in Elizabeth’s reign, produced what bears the name of “Elizabethan.”

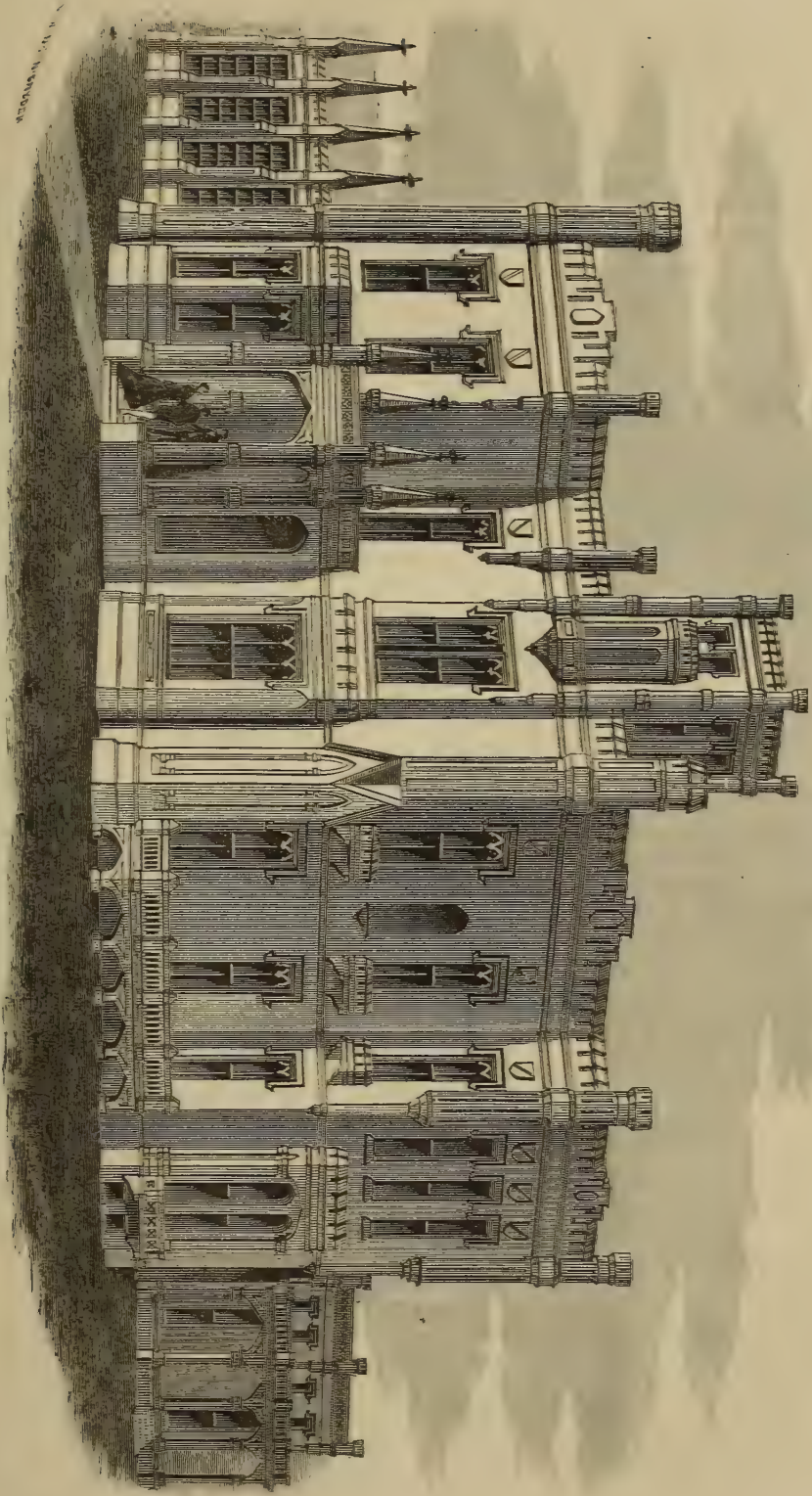
The subject of our present sketch belongs properly to this particular style; and forms a fair specimen of the domestic architecture of that period. As will be seen, it retains the Castellated features of the style of dwellings prevalent at the earlier era of the Tudor dynasty, interspersed with Gothic traits and details; the principal deviations from the mode of construction of the preceding period, being the more extended employment of Bay and Oriel-windows, and also of projecting Ornamental Porticos, the spaciousness and length of the Galleries and Halls, and the importance given to the Stairways.

One very noticeable peculiarity in this design is the use of the octagonal buttresses, attached to the walls above, terminating in insulated pillars below. These impart a striking effect to the building; and serve to make the parts behind them seem to retire more. In addition to these pinnacled buttresses there are corbeled pinnacles at the angles of the building. The tower, in this design, is strictly in keeping with the style, having battlements and an oriel-window in the upper section. The windows, throughout, have square heads with hoods, and are divided by mullions,

the lights being arched and cusped. The entrance is through a Porch with obtuse-pointed arch, and on either side of this are Bay-windows, one octagonal and the other square, on the ground-floor. This entrance porch has a buttress at each corner, terminating in a foliated finial. The Conservatory forms a useful, as well as pleasing feature to the design, with its buttresses, finials, and walls crowned by an embattled parapet. At the rear is the Billiard-room, in a detached building, accessible by a continuation of the hall through a covered passage; and also from the exterior, by means of steps leading into a Porch, through which the room itself is entered.

We will now proceed with a brief description of the accompanying ground-plan.

Entering through the porch, on the front, we come to the Vestibule A, beyond which is the Main Hall. On the left hand of this passage is the Reception-Parlor B, sixteen (16) feet by sixteen (16) feet, having an octagonal bay-window on the front, and an ordinary window on the side, extending to the level of the floor of an outer porch M, on that side. Proceeding through the passage, on the same side, is the Sitting-room C, sixteen (16) feet by twenty-five (25) feet, having at the end a triple group of large windows in the form of an arcade, with the sashes extending to the floor, connecting this room with the Conservatory H, seventeen (17) feet by twenty (20) feet. Communicating both with the Sitting-room and the Conservatory is the Dining-room F, a capacious apartment sixteen (16) feet by twenty-four (24) feet, having at the end a square bay-window, with a Balcony N, and two windows in the rear. Attached to the Dining-room is the Pantry J, fitted up with a Sink, Dumb-waiter and the requisite shelving, drawers, &c. Passing through the Pantry, we reach the Private Stairway I, and beyond is the Main Hall, at this point, twenty-five (25)



ELIZABETHIAN VILLA: LATE TUDOR-GOTHIC.



feet wide, containing the principal Stairway G. On the opposite side of the Main Hall, immediately fronting the Parlor and Sitting-room, is the Drawing-room D, an elegant apartment, eighteen (18) feet by twenty-five (25) feet, having in front a square bay-window, which forms the front of the tower. On the side of this room, there are two windows, which extend to the floor, and through which access is had to a Balcony N. Communicating with this room, by means of sliding-doors, is a second drawing-room, or, as it may be termed, a Library, sixteen (16) feet by twenty-five (25) feet, having a square bay-window, with two

divisions and an outer balcony around it, and two windows in the rear, leading on to a Balcony N, the entire length occupied by the windows. At the end of the Main Hall, there is a door leading into a covered Passage-way K, which connects the main dwelling with the Billiard-room L, twenty (20) feet by twenty-one (21) feet, a well-lighted apartment, as will be seen, by a glance at the plan, having on one side a Porch M, through which the room is entered, by means of a couple of glass doors. In the rear there is another glass door, leading on to a smaller octagonal Porch; and on the other side are two windows.

This completes the internal arrangement of the principal floor. That of the upper story will, of course, correspond, in a great measure, with the lower; and there will be ample space for at least seven or eight good-sized and convenient chambers, sufficient for a family of eight or ten persons, exclusive of domestics.

The design is such as can readily be constructed with brick; and should be painted of a neutral tint, or what is usually called a French gray. The principal feature and capping might, with advantage, be made of galvanized iron, which is an economical and desirable material for such purposes.

A structure such as this could be erected, in the vicinity of Philadelphia, for the sum of thirty-six thousand dollars (\$36,000.)

PRESBYTERIAN CHURCH, BRIDGETON, NEW JERSEY.

WE here exhibit a design of a church edifice, which has been recently erected in Bridgeton, a very flourishing and busy town in the State of New Jersey, having a port of entry, and being the county-seat of Cumberland county. It is situated on both sides of the Cohansey creek, twenty miles from its entrance into Delaware Bay, and forty miles to the southward of Philadelphia. With this latter place it has ready access by the West Jersey Railroad, which passes through it. A drawbridge connects the opposite banks of the creek, on which the town is built, thereby not impeding the active trade, which is here carried on, by means of a large number of schooners and sloops.

Among the more important manufactories, to which Bridgeton owes its increasing and thriving trade, are iron foundries, a rolling-mill, glass works, woollen and nail factories.

This thriving little town of Bridgeton

possesses some handsome and architectural buildings, and is, on the whole, neatly built, and surrounded by a beautiful and fertile country. It contains no less than ten Churches, a Court House, a Bank, three or four Academies, a Public Library and newspaper offices.

The subject of our sketch is a church, which is under course of erection for the Presbyterian congregation, and of which the Chapel is completed, and the walls of the main building are above the level of the first floor. The illustration, in perspective, speaks for itself so plainly, that any remarks upon it, beyond what may incidentally be included in the following description of the plan of the edifice, would be superfluous.

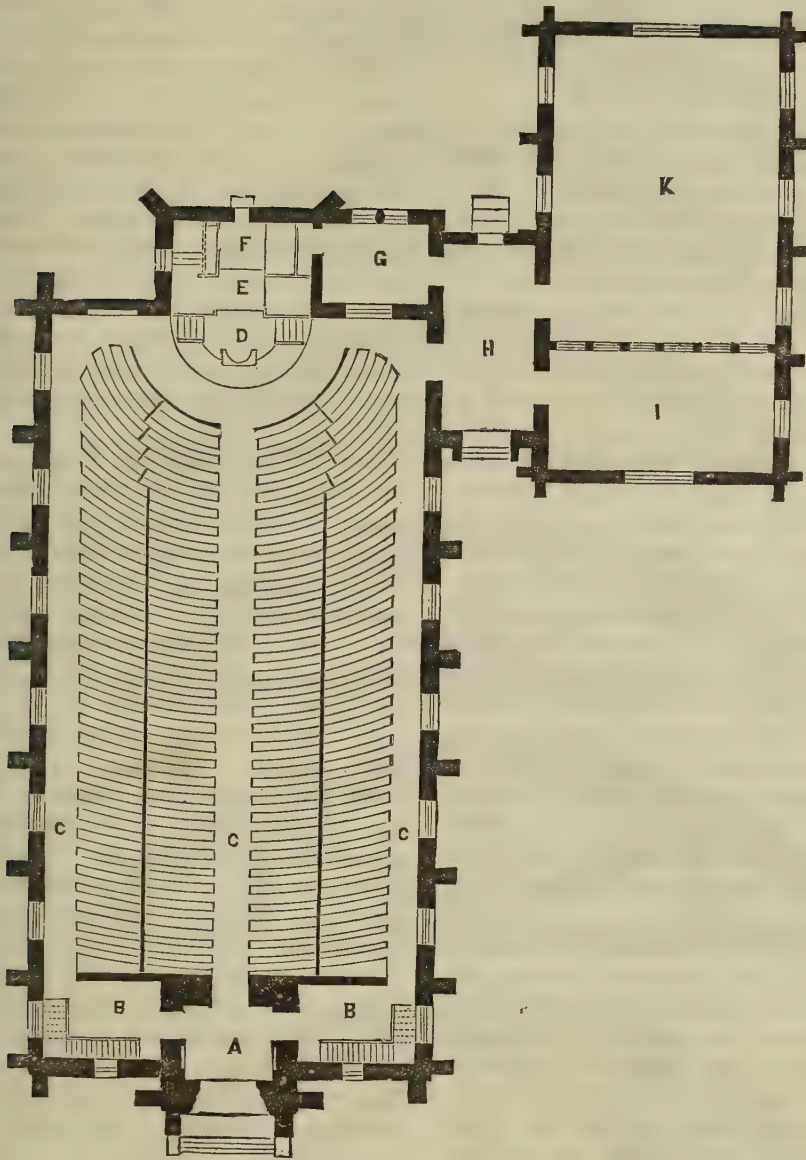
The entrance into the main building, which contains the Audience-room, is by a flight of five steps into a vestibule, A, 9 feet wide, on either side of which is a stair-hall to the gallery above, B, B. Passing through the vestibule, we enter the Audience-room, which is fifty-three (53) feet wide, by eighty-six feet six inches (86 ft. 6 in.) long, having a recess on the rear ten (10) feet in depth, by twenty (20) feet wide in the clear.

The Audience-room is divided by a centre aisle five (5) feet broad, and two side aisles four (4) feet wide on either side; between these the pews are ranged, divided into two; each pew is of sufficient length to afford five sittings. D is the Pulpit, behind which is placed the Organ, F, fronting the congregation, to which access is obtained by an outer door in the rear, leading up to the left by a flight of steps to the organ-loft, E. To the right of the organ is a door leading to the Pastor's Study, G, communicating with a vestibule, H, through which we enter the Chapel, K, and which has also an entrance from the outside at the front, and egress at the rear, by means of doors at either end. This vestibule, H, is twenty-two feet six inches (22 ft. 6 in.) long by twelve (12) feet wide, and in addition, has a door of communication,



VAN WICKEN-SWICK

PRESBYTERIAN CHURCH: BRIDGETON, NEW JERSEY



with the Audience-room. To the right is the Chapel, K, sixty (60) feet long by thirty-three (33) feet wide, which is a well-lighted and otherwise comfortably fitted-up room, and the exterior is, as will be seen, in entire keeping with that of the main edifice. This Chapel is divided into two compartments: the smaller one in the front being fourteen (14) feet wide by means of sliding glass sashes, which can be put up, or down,

whenever occasion requires, for Sunday school or other purposes.

The Tower on the front of the main building, through which is the principal entrance, projects four feet six inches (4 ft. 6 in.) and is eighteen (18) feet square, and one hundred and sixty (160) feet total height, built of stone. The covering of the Roof and of the Spire is to be of the best quality slate, varied in color and in form.

PRACTICAL CARPENTRY.

CENTERING.

IN the preceding number of our REVIEW we gave the most useful of the problems on the figures most generally used in arching openings; and now we place before our readers the most useful, because the most used, of Centerings or framing for the correct construction of such archings.

FIG. 1. Is the most simple of centres, and is intended for a segment-arch to cover an opening from eight to ten feet wide. It is made of one-inch stuff. Each rib is of a single board, and strengthened by three pieces securely nailed on the side, one being six inches wide; and each of the side-pieces four inches.

FIG. 2. This represents a simple centering for an arch from ten to twelve feet span. It is constructed of one-inch stuff in two segments butting against each other at top, and braced by a piece of two-inch plank, shouldered to a tie below and to the meeting segments above. The heels of the two segment-pieces as well as the heads, will be cut in, in like manner, and the whole firmly nailed.

FIG. 3. This centering is to cover a span of from twelve to fourteen feet. The construction is like the preceding one, but of two-inch stuff. The centre support is three inches thick by eight inches wide, cut into the tie, two inches, and the segments into it at their point of meeting, two inches; all securely nailed. The tie in this case is to be six inches wide by two inches thick.

FIG. 4. The centering represented in this figure is to accommodate a span of fourteen to sixteen feet. The chief distinction between it and the preceding one is, that there are struts at either side of the centre or king-piece; which struts abut against the latter and are thoroughly shouldered to the segments. These struts are three inches by four, whilst the centre is three by eight inches.

The segments to be two inches thick, and the tie to be three inches by six.

FIG. 5. Here we have a span of sixteen to eighteen feet. The tie is three inches by eight. The centre-piece ten by three. The struts are three by six. The segments are four in number, and are shouldered into the struts. There are in addition, two side-studs shouldered into the tie, and having the segments likewise shouldered into them. These studs are three by six inches, as are the struts. The segments are three inches thick. The whole to be stoutly nailed together.

FIG. 6. We have in this a centering for an eighteen feet span heavy arch of masonry. The tie to be eight inches deep; the principals eight inches; and the four segments eight inches at their narrowest parts; the struts six inches; firing struts, to keep the segments in their places and be halved on them, each six inches; the king-post to be ten inches at the head and foot, and six inches between. The whole to be secured and to have iron straps at the feet of the principals, to pass around and secure them to the tie-beams. The foot of the king-post is to be pinned to the tie-beam. The wall-plates are to be four by ten each.

It is to be understood that we now only treat of the simplest forms of Centering. Our intention is to review the subject in its more intricate detail, and give our better-informed readers a few problems well worthy of their study.

COTTAGE VILLA.

THE elevation, herewith given, shows a Design for a COTTAGE VILLA, in the GOTHIC style of architecture, such as, we think, would form a comfortable little habitation for a gentleman of limited income. As a very natural and laudable result, the possession of a cultivated taste has enlarged our love for the picturesque, and a desire for the embellishment of our homes; the latter, a

Fig.1.



Fig.2.

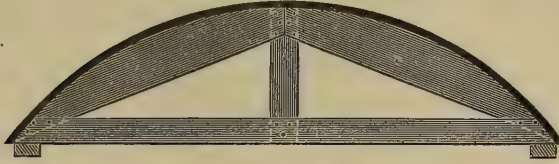


Fig.3.

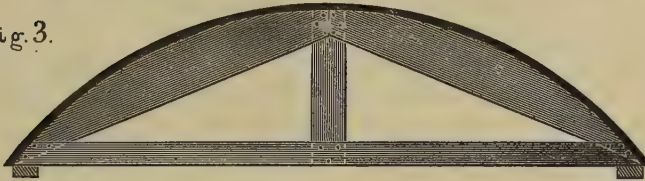


Fig.4.

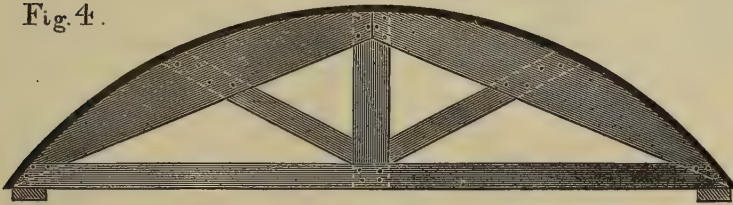


Fig.5.

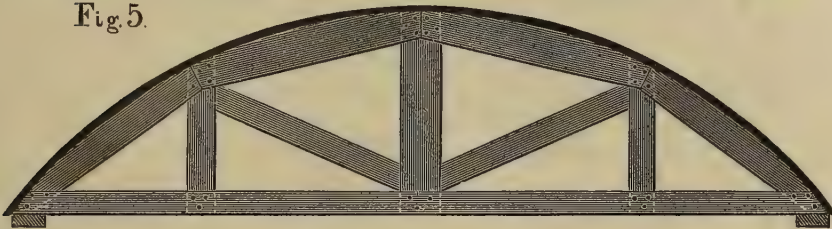
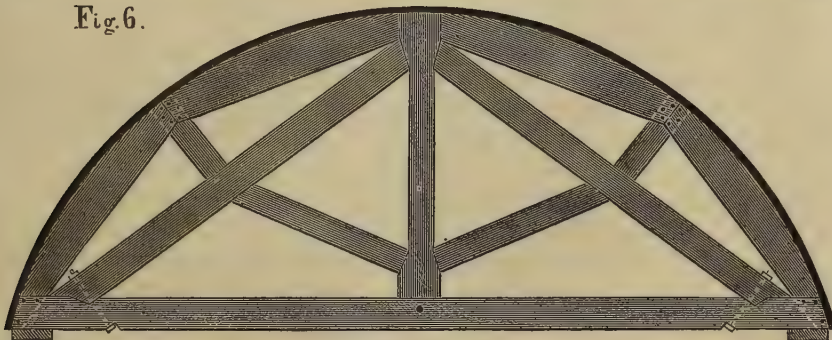


Fig.6.



W.R.WEST,SC:PHILADELPHIA.



charm, which can be obtained in an humble cottage, at a small expense, with just as much ease, as in a palatial mansion, built at great expense. It may here be observed, that we are not now content, as we were only a few short years ago, with what furnished the bare necessities of life; but now demand, not only whatever conduces towards comfort and convenience, but also whatever gratifies that innate love of the beautiful which is inherent in our very nature, and which can only be developed by culture and civilization. Hence it is owing to this feeling, that we see every where springing up around us, throughout the land, ornamental cottages, cottage villas, and rural residences, of more or less pretensions and extent. We are becoming alive to the fact, that the stronger the associations of elegance and taste which we can gather around our homes, and the more they are beautified and adorned, the more our social affections and local attachments become strength-

ened, our comfort and happiness increased, and ourselves individually rendered better members of society at large.

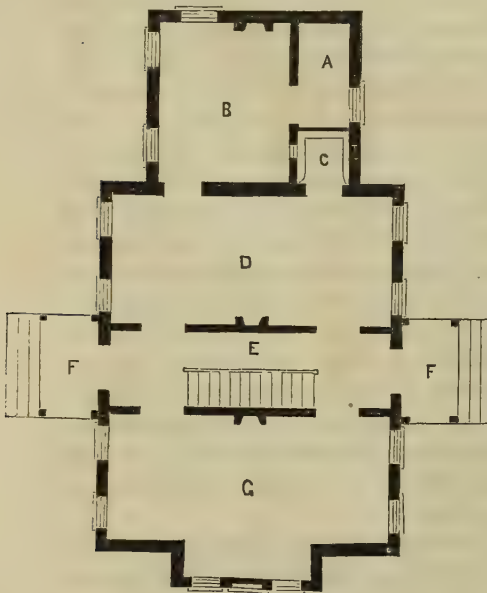
There can be little doubt, that for the particular class of buildings to which our illustration belongs—viz., Country Residences—the Gothic style of architecture particularly recommends itself. Capable of great variety of outline, both in plan and elevation—and, as a resultant, bolder effects of light and shade—it is particularly well adapted for detached buildings. The roofs and chimneys, which in other styles, such as the Grecian, are studiously concealed from view, are here prominently made available, to add to the general picturesque appearance.

We have spoken of our illustration as a Cottage Villa; it cannot well be called a *Cottage*; although it is very difficult to draw the exact line defining what are Cottages, and what Cottage Villas. This, however, is evidently something more than a Cottage, not only because it has

several rooms on each floor, but also because they are neither very small, nor very low; and the rooms on the second story are very little lower than those below. Whereas the principal features of a Cottage are small upper windows, generally in the roof. It has been very aptly said of such a class of buildings, that they are generally marked by a certain air of *deshabille*, and inattention to strict architectural costume, which oftentimes is engaging in its appearance. Perhaps the very best general definition of the Cottage style, as it has been called, ever given, is that it is the Tudor or Elizabethan *in undress*.

In the present design, there are two stories and a loft, the latter lighted by small windows in the gable end. The first story is ten feet, and the second eight feet eight inches in height in the clear.

The portion of the building to the right, which contains the Kitchen, Scullery, &c., is only one story in height. The gables have slightly ornamented



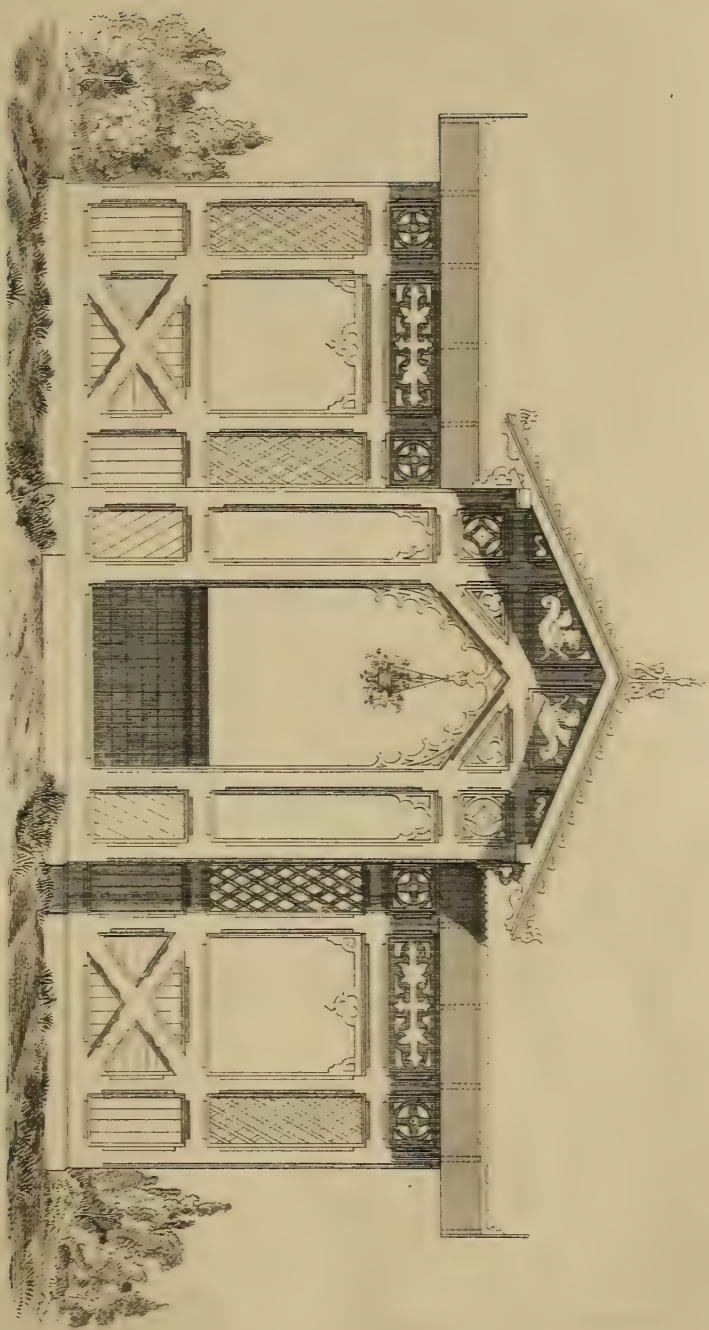
verge boards, with pointed finials; and, with the chimneys, the steep roofs, and projecting bay-window in the lower story, and oriel in the upper story, are

peculiar to this style, and assist greatly in giving effect to the design. The entrance is through a small characteristic Porch, F, into a hall or passage, E, 6 feet wide and 28 feet long, in which is the stairway to the upper story. To the left is the Dining-room, D, 14 feet by 14 feet, well lighted by two windows to the front and two to the rear, and communicating with the Kitchen, B, 14 feet by 12 feet, and the Scullery, A. There is a small China-closet or Pantry, C, attached also to the Dining-room.

On the other side of the passage, E, is the Parlor, G, 14 feet by 28 feet, a pleasant, cheerful room, well lighted by two windows in the front and two in the rear, and a large square bay-window, with three lights, forming a recess in the room. At the end of the hall there is another door, leading out to the rear of the building, having a Porch also. On the second story, there are four Chambers immediately above the Dining-room and Parlor, one of which has a smaller two-light projecting oriel window, forming an agreeable addition to a bed-room, both from its pleasing exterior effect, and affording space for stands of flowers.

SUMMER-HOUSES.

IN planning and designing the paths and embellishments of private, or even public grounds, but more especially the former, there are no more pleasing or effective accessories to a country seat, than SUMMER-HOUSES, if they have been located and constructed with the requisite degree of care and taste. The paramount intention of all such accessories is to add to the character and the beauty of the surrounding scenery. In order to obtain this desirable end, too much attention cannot be bestowed upon the study of obtaining an appropriate situation, and a consistency of architectural character, so that they may be in unison with the principal dwelling and the adjacent landscape.



DESIGN FOR A RUSTIC SUMMER HOUSE,

By ALBERT NAER.

Fig. 5.



Fig. 4

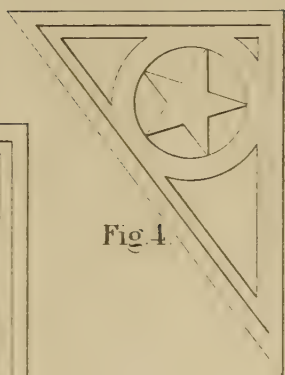


Fig. 1.



Fig. 7.



Fig. 2.

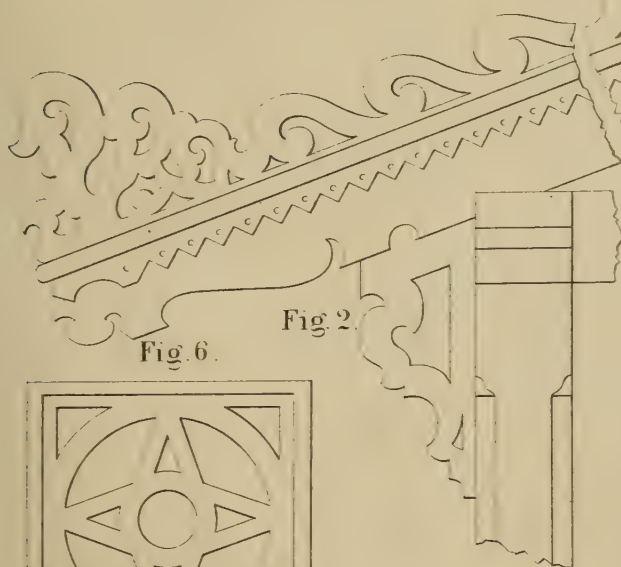


Fig. 6.



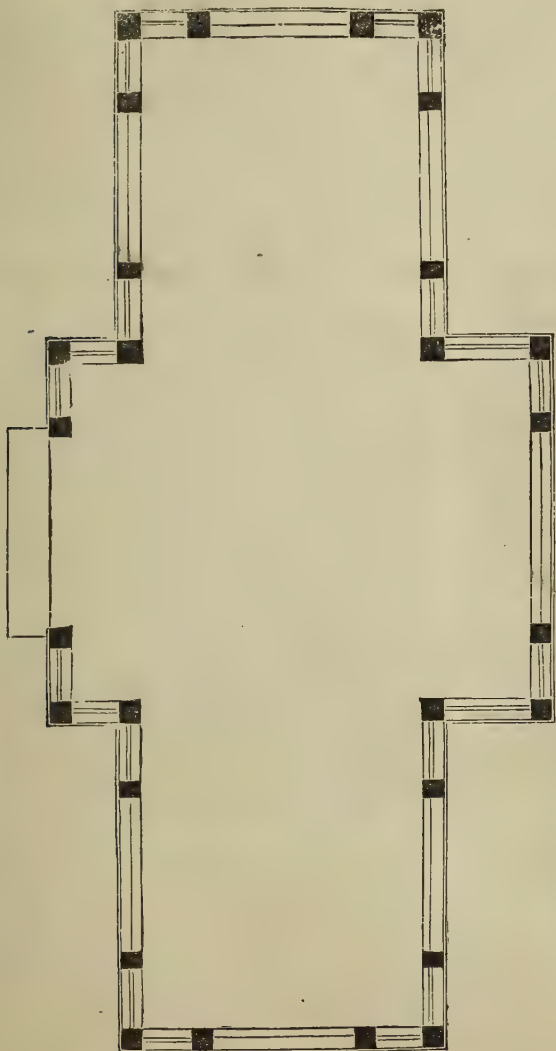
Fig. 3.



Such a situation should be selected, if practicable, as shall afford as many different views as possible; and, at the same time, be easily surveyed at the mansion, from different points. It should also, while not far distant from the house, be easy of access to the inmates.

There is less attention, we think, paid to the architectural decoration of our gardens and pleasure-grounds, than there should be. We surround ourselves with in-door comforts, and render our mansions and our villas replete with every possible modern convenience and elegance, with all the luxuries that can be

possessed; but neglect too often, the erection of those elegant and inexpensive structures, which make the garden pleasant at all seasons, and are equally desirable for comfort and style. It is not saying too much, that the generality of what we call "Summer-Houses" are structures, such as would—so far as regards architectural skill, judgment, and taste—be a disgrace to many a wandering savage. The erections required in gardens and pleasure-grounds are not numerous; but, in designing them, more care is required, than perhaps in any other kind of building.



The principle, which underlies the whole science of architecture, that every building should, in its style, be in harmony with the site on which it is placed, applies, with equal force, to garden architecture. The smallest structure, even though designed for inferior purposes, is not beneath the attention of the architect when it is intended to lend additional beauty to the general effect. If such are executed without design, and by an unpractised and unprofessional hand, instead of forming picturesque and elegant features in the landscape, they appear ridiculous, and detract from the otherwise pleasing architectural effect of the whole.

In the hope, that our foregoing brief remarks may have an effect of drawing attention to this, hitherto, comparatively neglected branch of the art, we have, in the accompanying plate, shown an unexecuted study for a rustic Summer-House, the design of Mr. Albert Naer, of Washington, D. C. As it will be seen, it is

a highly, ornamental structure, well adapted for any eminence, or other location, where it would become a prominent feature in the landscape; and would form a highly decorative and pleasing object, either in the garden or pleasure-ground. The profuseness of ornamentation, lavished on it, which would appear in a villa inconsistent, here becomes natural and appropriate, and can be appreciated by every one.

In the accompanying plate, we have given some of the details of this Summer-House, showing, on a somewhat larger scale, a few of the more prominent ornaments. The plan and elevation show the manner of framing. The principal timbers are five (5) inches square, cross section, with corners chamfered; the

brackets of two (2) inch stuff; the paneling one and a-half ($1\frac{1}{2}$) inches thick. Fig. 1. Apex of Gable, with finial. Fig. 2. Cornice, showing brackets and Ridge finish. Fig. 3. Panels in Tympanum. Fig. 4. Spandrel panels. Fig. 5. Square panels next Tympanum. Fig. 6. Square panels in Cornice of Wing. Fig. 7. Centre panels of the same, giving another treatment of design.

The building should be painted either of a drab or a fawn color; the chamfers and the edges of the small scroll work, red. The lions also should be outlined in red.

The roof should be slated, diamond pattern, and varied in color.

The floor to be laid with narrow boards and elevated one foot above the ground.

MERRICK'S PATENT SAFETY APPLIANCE FOR HOISTING-CAGES.

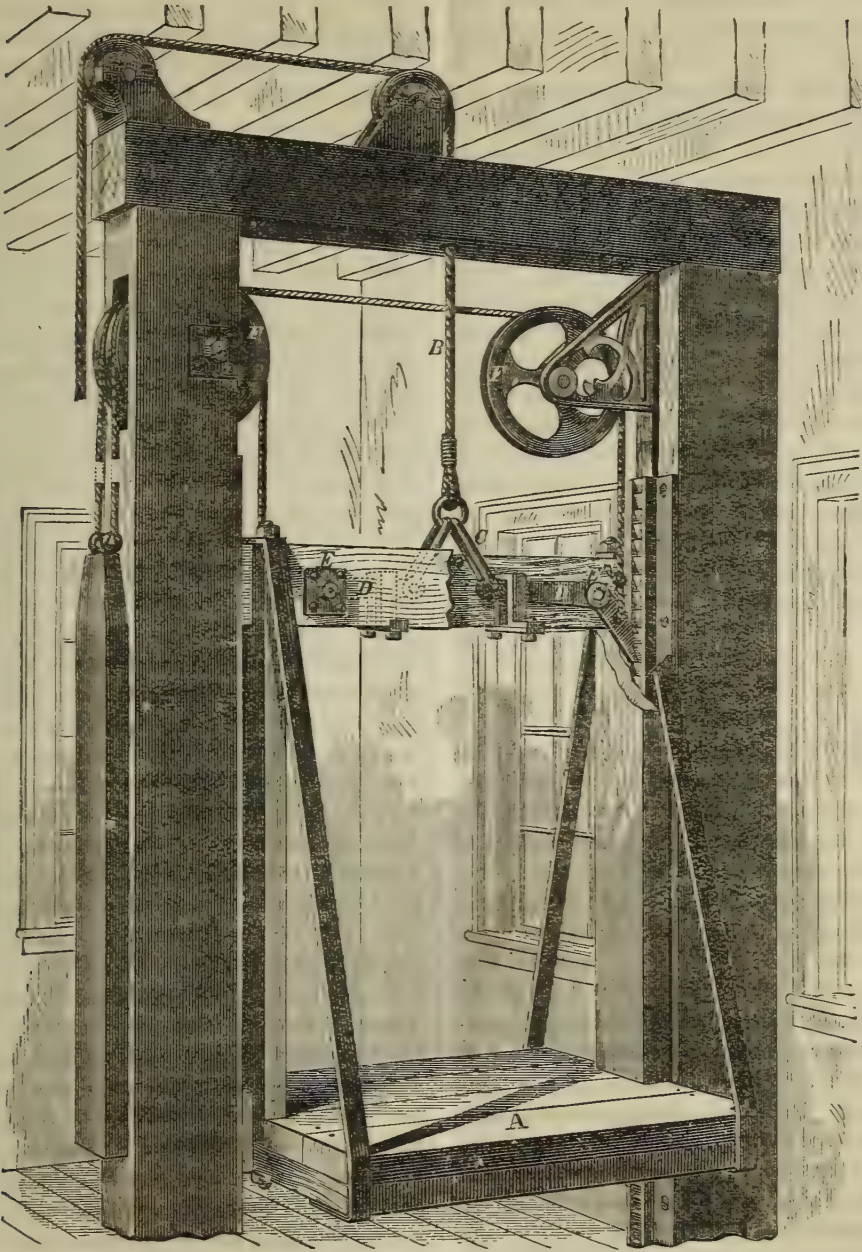
THE use of power hoisting-machines, of which an essential element is a platform, or cage, on which goods can be quickly loaded and unloaded, has, of late, become so general, as to be considered almost indispensable, where goods have to be handled in large quantities.

In these machines, appliances for the prevention of accidents, caused by the breaking of the hoisting-rope, have come to be a necessity; but still more are they required, where, as in large hotels, they are used exclusively for the carrying of passengers from floor to floor, and where, in case of accident, loss of life is almost sure to follow.

The general principle on which it has been attempted to make these machines safe, is that of fitting them with iron racks, secured to timbers, extending the whole height of the hoistway, into which levers shall engage, whenever the strain is taken off of the hoisting-rope. Springs are usually applied to the levers, in such

manner, that, while the hoisting-rope is intact, they are in a state of compression, and ready to force the safety-levers into the racks, so soon as the strain is slackened. Unfortunately, springs are not wholly reliable, it very frequently happening that, just at the time when their action is of vital consequence, they are found to be broken, or to have lost their elasticity.

The object of the improvement, of which the accompanying engraving is an illustration, is to provide a certain means for preventing the fall of the cage in consequence of accident to the hoisting-rope or chain. In this device the operation of the arresting levers is assured, as they are engaged with the rack instantly, in case of the breakage of the hoisting-rope, by means of a counterbalance or weight, which, when the cage or platform is ascending, is moving in a contrary direction, thus giving the additional advantage of reducing the weight of the cage. When-



ever the hoisting-rope or chain ceases to act, the counterbalance rope comes into action and prevents disaster. In the engraving, A is the hoisting-cage or platform ; B, the lifting chain, attached by means of links, C, to the bell crank levers, D, having their fulcrums at E, and provided at the other end with teeth

cut to fit the racks in the uprights of the framing. The ropes suspending the counterbalance weights are attached to the levers, D, at points outside their fulcrums, and pass over grooved pulleys, F. The operation of the machine and its arrangements is apparent from an examination of the illustration. So long

as the hoisting-rope is held "taut," the levers, to which it is attached, are drawn away from the racks, and the machine operates freely; but the instant the hoisting-rope breaks, or is slackened suddenly from any cause, the weight of the cage and its load comes upon the counterbalance ropes, the levers instantly engage with the racks, and the descent of the cage is prevented. There is no possibility of the device getting out of order, and ceasing to operate, without, at once, so interfering with the proper use of the hoist, as to call attention to the fact. A large machine is in operation at the works of MERRICK & SONS, Philadelphia, Pa., and a working model may be seen at their office, 62 Broadway, New York city. Further information may be obtained by addressing the patentees, at either place.

MASONRY.

WHO ever bestows a thought on the wonderful testimonials of mental and manual effort which the mason has filled the world with, and gives the credit due to that craft?

The magnificent ruins of ancient times, the modern glories of our own, are alike the work of the mason. The design is always justly accredited to the architect, but he who carries the requirements of that design into execution is surely entitled to a little acknowledgment. How often has it happened that the skill of the mason has saved the very reputation of the architect, by providing for some unforeseen point of weakness, or other defect. Yet the mason's modest worth is buried in oblivion, whilst the architect's fame is emblazoned on the history of his work to live whilst a stone remains of the construction. In fact, the casual loss of the name of the architect is said to be almost equal to the incompleteness of the work of Cologne Cathedral, and actually drew forth the powers of fiction in a

legend to account for the missing name. Yet, the diligent inquirer into the historical relations of buildings will assign a high place in his inquiry to the business of the mason. It would be difficult, indeed, to mention any other business so closely connected with the progress of our race to which science and art are so much indebted—to which religion itself owes so many of its nobler influences. The mason has joined together in one unbroken chain, the two extremes of civilization. His genius is alike conspicuous in the rudely sculptured pillar of the Cromlech and the exquisitely proportioned column of the Parthenon. He built the altars from which arose the smoke of human sacrifice, and he reared the temples in which no sacrifice is offered but that to the true God—the offering of a Christian heart. Centuries before the dawn of civilization in the empires of the West of Europe he constructed those monuments of rude but magnificent grandeur which moulder now upon the banks of the Ganges and the Nile. It was he who reared the stately temples of Minerva and Jupiter, which were so inseparably associated with all that was noble in Grecian philosophy—all that was beautiful in Grecian Art. And, in the dark ages which followed the downfall of western civilization in Europe, when the temples of Rome were ruined, the palaces of the Cæsars plundered, the Pantheon despoiled, the amphitheatres laid waste, it was he who reared up the noble piles of Christian Architecture, which ushered in a new era in the history of the world, and another and a more beneficent period of human existence. The relics of Palmyra's former grandeur, and of Baalbec's greatness, still linger to attest the wonderful skill of the masons of those days. And not a vestige of a temple, or arch of triumph, but acts as a chronicler of the deeds of those artisans whose names are lost, though the yet distinct marks of their work still live as a mockery of fame.

THE BRONZE HORSES OF VENICE.

EVERY American who visits the beautiful "Bride of the Adriatic," as Venice is called, must be struck with the silence that reigns in that city of the sea, owing to the total absence of wheeled vehicles. No sound of travel is heard from morn till night save the "cheep," "cheep," of the oars of the gondola as it shoots off from beneath your window, black and mysterious, like some flitting shadow of a dream. The sound of horses' hoofs which in our own crowded cities is so apt to confound us with that ceaseless clatter, is here never heard; and indeed it may be said that there are but four horses in all Venice, and those the oldest in the world, the bronze steeds of the eminent sculptor, Lysippus, which stand on the portico of St. Mark.

The history of those horses is highly interesting. They are generally supposed to be the work of Lysippus, who lived three hundred years before Christ. They first adorned the pediment of one of those classic temples of Corinth. But Greece fell beneath the power of Rome, and Corinth was destroyed by the Consul Mummius. The four bronze horses were secured to grace the barbarous triumph, and were, in 146 years before Christ, placed on the Temple of Peace, at Rome. Constantine the Great, on removing the seat of Roman Empire to Byzantium, to which he gave his name, had the four bronze horses to adorn this new capital, Constantinople. Greece and Rome both in turn crumbled to decay; the latter falling victim to the barbarous hordes that surrounded it. This decline of Roman empire was the impelling cause of the birth of Venice as Queen of the Seas. In the year of our Lord 451 the conquering sword of Attila destroyed Verona, Mantua, &c., whose inhabitants in numbers sought refuge in the islands of the Adriatic,

and thus grew up the Venice which was to rank high among the chronicled cities of history.

About the middle of the thirteenth century Alexis was dethroned by his subjects, who held possession of his capital, Constantinople. His son applied to the then powerful maritime republic of Venice for assistance, and he received it. Never was support given with more willingness, for Venice saw the opportunity to expand her growing power, and so the capture of Constantinople was rapidly followed by the conquest of the isles of Greece. The four bronze horses again changed quarters and Venice now boasted her first importation in that line. They were placed on the portico of the magnificent Church of St. Mark, facing the Piazza di San Marco. Here they rested until that child of fate, Napoleon I., in his plundering career of conquest, took them, with the choicest art-gems of his vanquished enemies, to enrich the French capital. The four bronze horses were set upon the triumphal arch in the Place du Carousal at Paris, by his order previous to 1815. This triumphal Arch du Carousal, a veritable *chef d'œuvre* of elegance and good taste, stands at the entrance of the Court of the Tuileries. Napoleon ordered the architects Percier and Fontaine to build it in 1806, to celebrate the glory of the French armies. But the star of his destiny went out, and by the treaty of 1815, the Allied Powers restored the four bronze horses to Venice, where any of our readers may see them in their old position, on the Portico of St. Mark's; after a record of *over two thousand years duration!* There, it is to be hoped, they may remain for many centuries to come, undisturbed by the political changes of Peace, and

— in the event of War
To snuff, unmoved, the battle from afar.

THE ARCHITECT:

A NEW, BRITISH, WEEKLY JOURNAL.

WE cannot, we think, carry out the wishes of our correspondent, as conveyed in the following letter, in a more satisfactory and advantageous manner, than by publishing, *in extenso*, both his letter and the accompanying Prospectus of the new English Architectural Periodical, which he is about to start. We do this with the more readiness and gratification, as we feel sure, that the advent of this new Journal, starting under such very powerful and favorable auspices, and promising such a varied and highly interesting range of subjects, will be hailed with pleasure and encouragement, by not only all lovers of our Art, in this country, but by every one, who feels an interest in the advancement and dissemination of knowledge in any way, however remotely, connected with it. The letter so fully and so ably speaks for itself, that any further preface from our pen would be superfluous.

LONDON, S. W.,

22 Jermyn Street,

November 21, 1868.

TO SAMUEL SLOAN, ESQ.,

Editor of The Architectural Review

and Builders' Journal:

DEAR SIR: My friend, our distinguished Architect, Mr. G. Gilbert Scott, R. A., has permitted me to see the letter, that you were so good as to address to him, when you sent him a copy of the prospectus of your Journal, a publication, which, I am confident, must possess many high and excellent qualities. I now have to request you to read the Prospectus, herewith enclosed, of a new, English, weekly, illustrated Periodical, of which I am the Editor. This new Journal aspires to take a high position. It is in strong hands, in the matter of proprietorship; and it has the very best

support here in England, and also in France and Germany. It will treat of both Architecture and Constructive Civil Engineering, and also of whatever is connected with the Building Trades. Moreover, it also will comprehend descriptive and critical notices of *all* works of high and noble Art, particularly such works, of whatsoever class and kind, as possess qualities, that are suggestive to artists and manufacturers. For example, in London, the "South Kensington Museum," established, on a system of practical efficiency, by the late Prince Consort, has now attained to the rank of a National Institution, of the first magnitude, interest, and importance; it is constantly enriched with fresh acquisitions, and as constantly the most valuable private collections are exhibited there for a while, having been *lent*, for that purpose, by the proprietors. The Museum is also intimately associated with the system (now in active operation throughout Great Britain) of National Art Education. This Museum has, at present, no organ; there is no accredited publication, which records, describes, criticises, and applies, for general use, its contents, &c. My Journal will supply this great want, with the cordial support and coöperation of the authorities. Again, in quite another field, I shall give, direct from headquarters, regular and systematic reports of the proceedings of the organized exploration, now being carried out with such remarkable results, in the Holy Land; and particularly in Jerusalem. I adduce these, as examples of my range of subjects, as well as of their character. In every instance, I shall give the best engravings of all works and objects of the greatest general value and interest. For this work, sir, I am anxious to obtain your coöperation. I shall be de-

lighted to make your own Journal known in England, and in the English colonies and dependencies. I shall be glad to quote from your pages; and to reproduce, as specimens, some of your illustrations; and I shall have a real pleasure in offering to you a reciprocation of the same friendly offices. I think a happy cordiality, between your great country and my own, may be infinitely strengthened by a vast increase of that interchange of thought and sentiment, which arises from the most enlarged use of the same literary and artistic publications, in both countries; and certainly, Art, in every form and expression, while equally dear to us both, cannot fail to exercise, over us both, a beneficent influence. I particularly desire to make your great works known and valued here; and also to secure for our own an increased familiarity amongst your countrymen. My first number, to be published on January 1, 1869, shall be sent to you; and its successors shall follow.

I am, my dear sir, faithfully yours,

CHARLES BOUTELL,

(M. A. of Oxford.)

Editor of "*The Architect*."

THE ARCHITECT, A JOURNAL OF ART,
CIVIL ENGINEERING, AND BUILDING.
Published every Friday, at the (Temporary) Offices, 4, Monument Yard,
London, E. C. Price 4d.; or, post
free, 5d.

The Motive, Aim, and Range of this Journal, which are clearly indicated by its Title, may be more fully set forth as follows:

"*The Architect*," is a Journal of *Art*—preëminently, and in a special sense and degree, it is a Journal devoted to the great art of *Architecture*. "*The Architect*," however, is not an Archæological Journal; consequently, whether treating of Architecture historically or critically, and as well when dealing with Architecture in its noblest and most dignified aspirations, as when consider-

ing the simplest details of its practical application, "*The Architect*" more or less directly refers to the sentiments, circumstances, usages, and requirements of the times now present.

To the other *Arts*, each one inseparably bound to every other, and all of them in close alliance with Architecture, "*The Architect*" assigns a becoming measure of its observant and thoughtful regard.

"*The Architect*" is a Journal of *Civil Engineering*. Placing the Civil Engineering of the present day, in all its varied forms of expression, side by side with *Architecture*, "*The Architect*" advocates and insists upon that cordial union between the highest Constructive Art and the highest Constructive Science, from which mutual advantages of the greatest and gravest importance must necessarily be derived.

"*The Architect*," again, is a Journal of *Building*. It accompanies the professional Architect from the commencement to the completion of his creations; it enters into all his plans and projects, and works with him in their practical realization. It concerns itself with every person, who may take any part in the erection of buildings of every class and order, in their decoration also, in their furniture, and in providing them with every appliance and accessory.

With Architecture and the allied Arts, with Civil Engineering and Building, "*The Architect*" associates the Members of the Architectural Profession and all other Artists, all Civil Engineers and Builders; so that, while seeking from them, one and all, coöperation and support, "*The Architect*," at the same time, assures them that in its pages they will ever find faithful and firm friendship, a jealous vindication of their honor, and a vigilant guardianship of their best interests. Nor is "*The Architect*," unmindful of what is due to the public—what the public by right may expect from it. Well aware that the true interests both of the public at

large and of the members of the artistic and constructive professions are identical, "The Architect" desires to strengthen its claims upon professional men by cultivating and seeking to elevate the public taste, and by leading the way to a better, because a more discerning and judicious, appreciation of whatever works are eminently meritorious and of a superior order of excellence.

Characterized by a complete and absolute independence, "The Architect" is the special advocate of *no particular style in Art, nor the partisan of any persons or any party.* The Descriptions given in the pages of "The Architect" will be faithful, explicit, and minute, the results of careful observation and mature reflection. The Criticism of "The Architect," to whatever class of works it may be directed, desires always to be refined in feeling and generous in expression, as in its principles it resolves always to be impartial and candid, just

and fearless. The Illustrations, drawn by Artists of the highest ability, and executed in the perfection of lithography and wood-engraving, constitute no unimportant features in this Journal. They will be freely given, and in every instance will really illustrate those passages in the text with which they may be associated. Thus "The Architect" takes its own ground, and has before it its own course: and, while consistently pursuing this course on its own ground, it aspires to be recognized and accepted as the Authority.

"The Architect" will be found to be a Chronicle of the practice and the progress of Architecture and the other Arts, of Civil Engineering, and of Building, in Great Britain, her Colonies and British India, the United States, and in all the most important cities and towns of the Continent of Europe.

CHARLES BOUTELL, M. A.,
Editor, 4 Monument Yard, London, E. C.

No. 1 to appear January 1, 1869.

OUR PINE RESOURCES.

BY F. H. WILLIAMS.*

IN a previous paper, we adverted to the paramount importance, and apparent necessity, of the presence of GOOD LUMBER in our BUILDINGS, and to the essential part it sustains in the practical workings of architecture. At the same time, allusion was made to the waste of that *most important of all our woods, WHITE PINE.*

Now, it happens, that many persons regard those, who are fearful of the extinction of this commodity, as, what they are pleased to term, "Croakers;" and believe, that it is mere "Old Fogysm" to entertain any such doubts and misgivings.

The silly term "inexhaustible" has

been so often carelessly and thoughtlessly applied, that we have, in a measure, become accustomed to its sound; and, as a consequence, have learned to regard it, as we do any common-place adjective used to designate a degree of quantity or quality, and one whose presence gives no particular force to the sentence in which it occurs.

This bad habit of using superlative adjectives is a growing evil; and in no instance is its pernicious influence more prominently demonstrated, than in its application to the vastness of our natural National resources.

On the lips of the majority of persons, it is quite as natural to speak of our

* Lumber Merchant, Seventeenth and Spring Garden streets, Philadelphia.

"inexhaustible mines," or our "inexhaustible forests," as it is to mention the most every-day circumstance, or assert the most trite fact.

The term can certainly never be correctly applied to any thing human or mundane. There is no one thing, or series of things, in this world, that will never become exhausted; nor is it right, that there should be. All-wise Providence has placed us here to *work out—not waste—the resources*, which He has placed at our command; and while He has shown us, by His own example, that we are to let "nothing be lost," our own past experience has proved that natural productions, which we had regarded as indispensable, have given out; and we have been compelled to apply other substances to those purposes, for which we thought nothing but the exhausted production adapted.

Our timber, which is regarded as unlimited in supply, is so perceptibly decreasing, and facts point so strongly towards its exhaustion, that it is at last beginning to excite some attention; and a number of arguments *pro* and *con* have made their appearance.

We have no right to presume, that Providence is going to raise up a new commodity for us, to take the place of timber, when our own prodigality shall have rendered it extinct. It is our duty to use our means economically, and to foster our resources; and, to that end, we should take active and immediate measures to insure the preservation and replenishment of our forests.

It is true, that the mere saying and advising will accomplish nothing; but we think, that a few figures and statistics, which tell "the plain, unvarnished truth," and into which no spirit of hyperbole enters, may not be amiss.

The great West, with its millions of acres of forest lands, stretching its vast expanse from the coast of Lake Michigan, and the western bounds of Indiana, Kentucky and Tennessee, far out, towards the setting sun, presents quite as

great a field for wonder and admiration, as do the more eastern portions of our country, with their hundreds of thousands of factories and workshops, and their busy millions of human beings.

Some years ago, it was said by a writer of much discrimination: "America is one vast forest, diversified occasionally by cultivated intervals;" showing how, *at that time*, to one whose observation was general, the cultivated and manufacturing portions of the country appeared as the exception to the rule—the patches which an increasing population had cut out of the main field, and not the field itself.

But how greatly have circumstances, occurring since the utterance of the above assertion, tended to modify it. It undoubtedly applies, with great force, to a large proportion of our area; but, if taken literally, as applied to our present condition, it is calculated to mislead many, with regard to the greatness of our timber lands.

It is true, moreover, that, notwithstanding our enormous resources in this respect, there is an absolute necessity, that we should foster and protect our timber. Without going into any calculation, it may be safe to say, that more Lumber has been cut within the past fifteen years, than during the previous half century; and that more will be cut in the next five years, than in the past fifteen. An acceptance of these hypotheses forces the conviction upon our minds, that, though our resources were trebled, we could not afford to be extravagant, in the face of the rapidly augmenting number of immigrants, who must find themselves homes in the great West, and of the large annual percentages of increase in our native population.

A writer upon this subject in 1862, endeavored to give his readers an idea of the consumption of Lumber, by showing that "it requires some *thirty acres*, of good ship-timber, to build a common-sized steamboat on our lakes." He

makes further calculations, demonstrating the fact, that, at the present rates of increase, it would require but thirty years, for the Chicago market alone, to exhaust all the Pine lands of Michigan, the greatest Pine producing State in the Union.

Says that vigorous writer, James Parton, in his description of Chicago:

"There is one commodity, in which Chicago deals, that makes a show proportioned to its importance. Six hundred and fourteen millions of feet of timber, equal to about fifty millions of ordinary Pine boards, which Chicago sold last year, (1866,) cannot be hidden in a corner.

"The prairies, to which Nature has been so variously bountiful, do lack this first necessity of the settler; and it is Chicago, that sends up the Lake for it; and supplies it to the prairies.

"Miles of timber yards extend along one of the forks of the river; and the harbor is choked with arriving timber vessels; timber trains shoot over the prairies, in every direction. To economize transportation, they are now beginning to despatch timber in the form of ready-made houses. There is a firm in Chicago, which is happy to furnish cottages and villas, school-houses, stores, taverns, churches, court-houses or towns—wholesale or retail—and to forward them, securely packed, to any part of the country.

"No doubt we shall soon have the exhilaration of reading advertisements of these town-makers, to the effect, that orders for the smallest villages will be thankfully received; county towns made to order; a metropolis furnished with punctuality and despatch; any town on our list sent, carriage-paid, on receipt of price; rows of cottages always on hand; churches in every style.

"N. B.—Clergymen and others are requested to call, before purchasing elsewhere."

This quotation merely by the way, however, as it is rather a laudation of

Chicago enterprise, than a proof of our assertions.

As has been already said, the State of Michigan is, by far, the greatest Pine-growing and Lumber-manufacturing State in the Union.

It contains 56,243 square miles, or 35,995,520 acres, which is indeed a large area, although it must be borne in mind that it is by no means all Lumber-producing. The population is, as yet, sparsely scattered over the country; but that it is showing a considerable annual percentage of increase may be seen by the following:

Population in 1830.....	30,000
" " 1840.....	212,000
" " 1850.....	398,000
" " 1860.....	749,000

Taking the last ten years as a basis, we find the ratio to be 88 per cent., which would give us about 1,400,000 as the population of the State in 1870.

Thus much for the population; we may have occasion to refer again to it; but, in the meanwhile, will take a glance at the timber product.

In the Saginaw Valley, the great manufacturing district of the State, during 1867, upwards of 420,000,000 feet were manufactured, by all the mills there situated, 82 in number.

By reference to the trade of this flourishing region, for that year, we arrive at the following result:

Number of mills, 82.

Saws, 183.

Capacity of mills, 826,209,099 feet.

Capital invested, \$3,428,500.

Lumber manufactured, 423,963,190 feet.

Logs in boom, 17,304,605 feet.

Men employed, 2,402.

Lath manufactured, 63,870,875 pieces.

During the same year, 115,293,000 shingles were manufactured in Saginaw Valley and on the Bay Shore, of which 105,983,275 were shipped to various points, East and West, the balance being held over till 1868. At the close of the

season of 1866, there remained, on the various docks upon the Saginaw river, upwards of 44,000,000 feet.

Notwithstanding the fact, that much less snow fell, than usual, during the following winter, and that the facilities afforded the lumber men were, in consequence, much abridged, a large amount of logs was lumbered, as may be seen by reference to the statement already given.

In or about the year 1836, the first lumber was shipped from the Saginaw district,—only two cargoes during the season.

By 1857, (21 years,) the annual product had reached 125,000,000 feet. In 1867, (10 years more) it was fully four times that amount, or 500,000,000 feet, being worth, at a low valuation, \$7,500,000.

Of Pine lumber there were cut on the river and tributaries :

In 1863.....	133,500,000 feet
In 1864.....	215,000,000 “
In 1865.....	250,639,340 “
In 1866.....	349,767,884 “
In 1867.....	423,963,190 “

Thus it appears, that the amount cut on the Saginaw has increased 220 per cent. in five years, or an average of 44 per cent. per annum. At the same ratio, this district will cut about *two billions* of feet, ten years hence.

We might look further, and (taking it for granted, that the supply would not give out before that time) contemplate the product, by the beginning of the next century. If any reader is sufficiently interested to make the calculation for himself, he can easily do so; he will then find himself encountered by such a battalion of numerals, as will puzzle him to give oral expression to.

We believe, however, that ten years are enough to prove our position; and that no thinking man can fail to recognize, in these figures, the fact, that we are rapidly using up our supply of Pine, without any proportionate replenishment:

It may be objected, that these are but the statistics of a single district. In answer to such suggestions, we append a table of the estimated production of the entire State for 1867 :

	Feet.
Saginaw.....	423,963,190
Bay Shore.....	84,995,772
Genesee County.....	68,000,000
Detroit.....	39,026,460
Tuscola County.....	5,800,000
Port Huron.....	30,000,000
Huron.....	33,850,500
Marine City.....	5,215,000
Lapeer County.....	16,500,000
Gratiot County.....	11,500,000
Sanilac County.....	8,750,000
Muskegon.....	205,278,000
White River.....	80,000,000
Ministee.....	110,400,000
Grand Traverse.....	24,000,000
Pere Marquette.....	46,000,000
Western Slope.....	185,000,000
	<hr/>
	1,378,278,922

Which, at an average of \$15 per thousand feet, is worth \$20,674,183.83.

The total amount of Laths manufactured is 284,646,200 pieces; Shingles 368,420,000.

Here, then, we see over thirteen hundred millions of feet of lumber, as the production of one State, for a single year; being, if we exclude Sundays, upwards of four million, one hundred and fifty thousand per day, or, allowing ten hours as a day's work, over four hundred and fifteen thousand feet per hour.

Now, there are 91 townships lying tributary to the Saginaw river, which contain Pine timber, and these 91 embrace pretty much all the lumber that can be produced in the greatest Pine portions of the State. Ninety-one townships are divided into 3,276 sections, or 26,208 lots. Experience proves that you cannot calculate more than 200,000 feet on a lot, and this will allow for *all* growths of timber, without any deductions made for fire, or other causes. This

calculation gives us five billions, two hundred and forty-one millions, six hundred thousand feet, which it would take seventeen years and a fraction to cut, at the rate of three hundred millions per annum.

But we have already shown, that in 1867 there were nearly *four hundred and twenty-four millions* cut, which shows very clearly, that—even though we make no account of the usual percentage of increase—all the Pine resources must be exhausted before the seventeen years shall have elapsed.

Probably the most abundantly supplied of all the districts in the State, is the Alpena district, including Devil River. The estimated stock of timber, on the ground, is 2,880,000,000 feet, a supply for over twenty-eight years, at the rate of 100,000,000 per year.

Many other districts have not over five or six years supply, at the present rate of consumption.

There are, doubtless, many people, who will say, that Michigan is not the United States; and that, therefore, our arguments prove but little.

To such persons, we would reply, that our Pine resources, without Michigan, would be very much like "the play of Hamlet, without the Prince."

Immense quantities of timber are growing in other States, without doubt, but their supply is used up in the same proportion. Indiana, which, not long ago, was thought to contain an "inexhaustible" supply of Black Walnut, will soon be obliged to import it, for her own use, if she wants it.

So with adjoining States. Our prairies, certainly, are not blessed with a soil so fertile as to give us much hope from *them*, and so we discover, after all, that, notwithstanding our enormous area, we are likely to be sorely puzzled, ere long, for a supply of lumber.

Surely the statistics above given furnish food for serious reflection, inasmuch as they demonstrate certain facts of grave importance, and induce some very

pertinent suggestions. They demonstrate:—

1st. That the commodity of Pine lumber is one of great comparative value, not only on account of its adaptation to uses so innumerable, but as an article of commerce, by whose production, shipment, and sale, so many thousands of our countrymen find an honorable livelihood.

2d. That the demand is increasing in a greater degree than is the population.

3d. That the acres of new growth are totally disproportioned to those annually cleared of their timber.

They induce the following suggestive queries:—

1st. *If we wish to continue the manufacture and sale of lumber*, does it not behove us to give our attention to *the increased production of Pine Forests, and to endeavor to render them somewhat adequate to the demand?*

2d. If the relative increase, in demand and population, continues to differ more widely, how long will our present and prospective stock of growing timber last?

3d. If the time arrives when our timber is exhausted, where shall we go to find a commodity to take its place?

These questions, often asked, still await a satisfactory response.

COMPARATIVE WEIGHT AND STRENGTH OF TIMBER.—Scarcely any thing can be more important, than definite and reliable information, concerning the comparative weight and strength of the different kinds of timber; but the ascertained facts are few and widely scattered. The Government should take up this matter and pursue it to an exhaustive conclusion. With respect to Comparative Weight, we have collated quite a number of authorities; and, where the data varied, have equated the various items, having finally had the advantage of revision, by a competent gentleman of this city, thoroughly conversant with timber. Upon this basis we venture to present the Table on our ensuing page.

TABULAR STATEMENT OF WEIGHTS OF TIMBER.

	DESCRIPTION.	Specific gravities.	Weight of 1 cubic inch in lbs.	Weight of 1 cubic foot in lbs.	Comparative weight of 1 cubic foot.		Weight or force required to tear asunder 1 square inch in lbs. avoird.	Length of a rod, which, if suspended, would be torn asunder by its own weight, in linear feet.
					Green. lbs. oz.	Seasoned. lbs. oz.		
Dry.	Ash . . .	.845	.031	52.81	58.00	50.00	14,130	39,050
	Beech . . .	.852	.031	53.25	58.00	50.00	12,225	38,940
	Birch . . .	.720	.026	45.00			15,000	
	Cedar . . .	.561					11,400	
	Cherry. . .	.715	.026	44.68				
	Cypress . .	.644	.023	40.00			6,000	
	Elm . . .	.800	.024	42.00	66.08	37.05	9,500	40,500
	Fir, Riga .				48.12	35.08	12,000	
	“ Yellow .	.657	.023	41.00			12,800	
	“ White .	.569	0.21	35.56				
	“ American .				44.12	30.11	8,800	
	Live Oak . .	1.170	.040	70.00			11,880	
	Mahogany . .	1.063	.038	66.44			21,000	
	Maple . . .	.750	.027	66.87			10,500	
	Mulberry . .	.897	.022	56.01				
	Oak, English	.972	.033	58.25	71.10	43.08	10,000	
	“ Seasoned .						13,600	
	“ Amer. White		.026	45.02			11,500	32,900
	Pine, Yellow .	.660	.024	41.25				
	“ White . .	.554	.020	34.62			10,000	
Well-seasoned.	“ Pitch . .						12,000	
	Poplar . . .	.383	.014	24.25			7,000	
	Walnut . . .	.671	.024	42.00			7,800	
	Willow . . .	.585	.021	36.56			13,000	
	Ash . . .	.722	.026	45.12				
	Beech . . .	.624	.023	39.00				
	Cherry . . .	.606	.022	38.00				
	Hickory, Red .	.838	.030	52.37				
	White Oak (Upland)	.687	.025	43.00				
	“ James River	.759	.027	47.44				

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING.

No. 5.

ON CHOOSING A SITUATION FOR A COUNTRY HOUSE AND GROUNDS.

"The measure of choosing well is, whether a man likes what he has chosen."

THERE are but few men, in active business, who do not look forward to the time, when they can possess themselves of a comfortable country home, where they may, when inclination prompts, retire from the bustle and excitement of the city, to enjoy the beauties of nature and all the pleasures and comforts of rural domestic life. The labors and enjoyments of the country are anticipated pleasures, for of all the various pursuits that may occupy the attention, there are few that afford so much genuine pleasure, as that to be derived from the culture of the soil.

This was the first employment of man; and all Adam's posterity seem to have an instinct to attempt for themselves the creation of an earthly paradise, where they can cultivate and adorn, and repose peacefully under their own vine and fig-tree. The force of circumstances—love of power and riches—and pride of place, may confine men to crowded cities; but, as the day of life passes its meridian, these actuating influences gradually subside; and the desire for the quiet calm of rural enjoyment becomes stronger, so that the evening of life may be spent in the contemplation of nature, as presented in fields and gardens.

Every change that we make in our habits of life is, to some extent, an experiment: it does not always happen that our ardent wishes are realized, and sometimes when they are, the realization is little short of disappointment. Before we can *live* in the country, and heartily enjoy all its delights, we must first *love* it, must feel a greater degree

of pleasure in roving over the green fields than in treading the carpeted saloon, learn to take an interest in all that belongs to its society and occupations, and enter intelligently upon its culture and improvements.

Cowley, the "amiable poet," in a letter to his friend Evelyn, author of *Sylva*, says: "I never had any other desire so strong, and so like to covetousness, as that one which I have had always, that I might be master at last of a small house and a large garden, with very moderate conveniences joined to them, and there dedicate the remainder of my life, only to the culture of them, and study of nature." In his biography we are told that every remove he made he got further and further from town, until at last his desire was gratified in the possession of a country estate, which he failed to enjoy. Writing shortly afterwards he says: "The first night that I came hither, I caught so great a cold, as made me keep my chamber ten days; and two days after, had such a bruise on my ribs with a fall, that I am yet unable to turn in bed. This is my personal fortune here to begin with. And besides, I can get no money from my tenants, and have my meadows eaten up every night by cattle put in by my neighbors. What this signifies, or may come to in time, God knows; if it be ominous, it can end in nothing less than hanging."

This kind of disappointment has been experienced by many persons, since Cowley's time; and assuming it to be a truth with but few exceptions, that the amount of pleasure derived from these rural pursuits will be in an exact ratio to the degree of the successful realization of previous anticipations, the necessity for careful reflection, and exercise of judgment, in selection of position,

and every kind of expenditure, cannot well be too highly estimated.

In choosing a location for a country residence, one of the first considerations is that of access to and from a city; especially if daily intercourse is contemplated, this circumstance will take a foremost place. The time, trouble and expense of travel on badly-kept roads, prove a serious tax upon the pleasures of the country. A drive of half an hour on a hard road during a fine summer evening, is decidedly different from an hour and a half spent on the same distance, in a snow storm, on a winter morning. I have known of a selection made during summer, when the road was all that could be wished for, to be rejected, when it was discovered that a rainy day rendered travel extremely disagreeable.

In these days of railroads and other steam conveyances, it is difficult to generalize upon what might be considered a convenient distance from a city. Upon a well-conducted railroad a distance of twenty miles may be of more convenient access than two miles upon a common road. Proximity to a railroad station will always secure a certainty of convenient transit, even allowing the distance to be within an easy carriage-drive in favorable weather, and such facilities should certainly not be overlooked, when they can be secured.

While a good road is always a great accommodation, it is not by any means desirable to locate a dwelling too near a much frequented highway. In dry weather, every vehicle that passes over it stirs up a cloud of dust, which penetrates everywhere, not excepting the lungs of those who have to breathe the offensive atmosphere; coating trees and flowers in an unsightly manner, and much to their injury. Should the property be bounded on any of its sides by such a road, it ought to be of sufficient extent, to allow the building to be placed beyond all such annoyances.

Healthiness of locality, it will at once

be conceded, is of paramount importance. Low, flat lands are generally damp and cold, and should never be chosen for habitations, either for man or beast, if there is any choice in the matter. Valleys, or even slight depressions, are equally unsuited: the air after sunset is always dense in such situations, dews are heavier and more frequent, and, as a consequence, frosts more prevalent, than on the elevations. Fogs, as is well known, are most frequent on low lands: the extremes of temperature are also greater, especially if surrounded and sheltered by hills or forests, which prevent the free circulation, and equalizing influence, of winds. Wide, lengthly valleys between uniform hills are occasionally subjected to disagreeable sweeping blasts, from certain points of the compass, rendering them very unfit as sites for dwellings. Even the vicinity of such localities ought to be avoided, for, although a person may drain, cultivate, plant and otherwise improve his own property, he may be constantly subjected to the influences of unimproved lands over which he has no control.

An elevated situation is generally healthy. The extent of prospect it secures is also an advantage, although mistakes are frequently made in placing too great value on distant views only. We soon become wearied in the contemplation of a distant prospect, the objects of which do not strike the eye distinctly. Its sameness soon takes on a stereotyped expression, accompanied by a certain vague indefiniteness; and, however pleasing the view may appear to a casual visitor, it ultimately loses its power of arresting the attention of those who see it daily. This does not apply so forcibly to maritime and river views, the constantly changing aspect of water by agitation, together with objects on its surface, is always interesting. Its capacity for reflecting forms on its margins, and the shadows of passing clouds, when calm, invest it with an attractive

variety of incidents, more satisfactory, however, in a near view, than when it is seen from a distance.

The exposure of an elevated site may be placed to its disadvantage for a permanent residence. The cool, airy and agreeable summer situation may become exceedingly bleak and uncomfortably chilly during winter. The difficulty of toiling up a steep ascent becomes, through repetition, both tedious and tiresome. The tender varieties of flowers, choice shrubs and trees, as well as the more useful products of the fruit and vegetable garden, are less likely to flourish, when freely exposed to sharp winds, although, with regard to these, great modification of rigorous local climates may be effected, by judiciously placed hedges of the more robust ever-green trees.

The partiality of most persons to locate their dwelling on the highest point of their property, without much regard either to comfort or convenience, is an error that they generally discover after it is too late to be remedied. I have often been astonished at the contracted points, mere dots of surface, upon which it was proposed to erect a stately mansion, where there was scarcely sufficient base to accommodate the foundation of a dove cot. Cutting down the point to a level platform, so far as to adapt it to the plan of the structure, does not obviate the difficulty of connection with the acute slope of the ground; it is always expensive to get a satisfactory road to a building in such a situation; and it is isolated from its surroundings almost beyond hopes of connection by the growth of trees during a lifetime. Exposed on all sides to every rude blast, the proprietor is ready to exclaim with Catullus: "My cottage, *Furius*, is not exposed to the blasts of the south, nor to those of the west, nor to the raging north, nor to the southeast; but to fifteen thousand two hundred blasts. Oh, that horrid and pestilent wind."

Perhaps the best position for a house is that of a somewhat level plateau at a moderate elevation, the ground sloping from it in all directions, more rapidly in front than back, where the descent is merely sufficient for surface drainage, then rising as it recedes so as to form a protection from the northeast, with a northerly continuation to the northwest. If the rising ground in the rear is covered with a timber growth it will be all the more acceptable. Back of the house a position may be selected for the culture of vegetables and small fruits, as also a locality for stables and other buildings, which will always receive full benefit of the shelter of the higher ground on the north. A position for greenhouses, graperies, and other garden structures may be found either on the east or west of the house, placed at proper distance back of its front line, as becomes subordinate structures.

This will leave an ample space in front for open lawn, ornamental trees and shrubberies, taking especial care that no dense plantations be introduced, to intercept a free circulation of west and south-west winds, so grateful during summer. If the neighborhood affords desirable views, a path may lead to a rustic structure, or prospect tower, situated at the most favorable point on the higher ground. This will be found in the end a more judicious arrangement, than that of erecting an expensive prospect tower on the dwelling-house, examples of which may occasionally be seen, so entirely out of all proportion to the size and pretensions of the building, as might lead one to surmise, that the principal occupation of the inhabitants was that of looking out of the windows. The following sketch will convey an idea of the arrangement that I have attempted to describe:

The adaptation of the site to contemplated improvements, should be carefully studied. I can recall an instance illustrative of this neglect. A small, one-story farm-house, occupied a posi-



tion on the edge of a fine healthy grove of oak and chestnut trees, a few of which had apparently been removed, so that the house could be fitted, as it were, in the cleared space. An undergrowth of dogwoods fringed the plantation, in early summer, with their snowy blossoms; a few yards in front sparkled clearly a small stream, which was spanned by a rude bridge; the humble structure so harmonized with its natural surroundings, that it seemed the embodiment of all the rural felicity, that is only to be realized (if *pastoral* poetry is truthful) "in a cottage near a wood."

It attracted the attention of a gentleman, who secured the property, for the purpose of erecting a fine mansion on the site. The position was rather low and secluded; but these trifles were overlooked. The old house was demolished; and building operations were commenced. Trees had to be cut away, to give space for the more extended structure. The course of the brook had to be changed, and removed to a greater distance. The three story building did not associate with its surroundings, as the former tenement had done. Cellar drainage was difficult and expensive to secure; and everywhere it was damp and uncomfortable. More trees had to be removed, to admit sun and air. The dogwoods had to be sacrificed. The depending marginal growths, that formed so pleasing a connection with the verdant meadow disappeared; and all the poetry of the situation vanished. The proprietor changed his mind, and the property changed its proprietor.

Further, as affecting health, the nature

of the soil should be investigated. Clay soils, especially when lying on a compact subsoil, that is retentive of water, are of the worst description, naturally, for the site of a dwelling. For purposes of cultivation, clay soils, properly drained and pulverized, are, in most respects the best of all; but the most perfect system of drainage will not prevent the surface from being adhesive and disagreeable for a time after rains, or more particularly in winter, during the thawing out of frost; clay parts with water slowly, even when drained, and compared with gravel, or sand formations, its constant dampness, so favorable to vegetable growth in dry weather, is very objectionable, when in close contact with the walls of a house. It is true, that by cementing their exterior surface, and rubble-draining their whole depth, much of the injury from damp may be avoided; but the walls will be colder than when set in dryer and more porous strata. The shrinkage and expansion of clays, according as they are dry or wet, is also an objection, with regard to foundation walls. If all other conditions are perfectly satisfactory, art can do much towards ameliorating the physical qualities of the soil; but for all purposes of human comfort and enjoyment, in the immediate vicinity of a house, a light, open, porous soil is eminently to be preferred.

It is always desirable to secure the additional beauty and sheltering protection of a natural plantation, when properly situated; but to select a building site in the centre of a grove of old trees, with a view of making them a nucleus

for future landscape effect, will almost invariably prove disastrous. In natural forests, the trees, in consequence of growing very closely together, have been deprived of the space necessary to full development, their trunks are long, slender, and destitute of branches. Thinning a grove of this kind is generally the first step towards its extermination. Something may be done by gradual, judicious thinning, and topping severely those that are left, so as to favor a new growth of branches; and I have seen an ultimate result of this treatment prove very satisfactory; but after many years of patient, or rather impatient, waiting on the part of the proprietor.

Where old trees abound, it is difficult to prepare or preserve a fine lawn, or introduce either flowers or shrubs. The old roots prevent thorough renovating culture; the scattering shade of the lofty trees interferes with the growth of young plants. There is a constant antagonism, a "struggle for existence" between the old and the new, both in regard to individual growth and landscape effect, until either the one or the other predominates. It is no matter of doubt or uncertainty, but a settled question by all, who have any experience in remodeling or adapting old woods to modern improvements, that it is greatly preferable to commence on a naked field.

A judicious selection and intermixture of rapid-growing trees, properly planted in good soil, will, in a very few years, produce the desired effects; serve all useful purposes; and give more complete satisfaction, than can be derived from the accidental position and growth of natural forests, so far as regards grounds in the immediate vicinity of a residence.

The character and general demeanor of the inhabitants of the neighborhood may be included in the essentials of selection. Persons of culture and refinement, who have been accustomed to the

usages and privileges of educated society, cannot expect to enjoy themselves in a semi-civilized community, where they may be subjected to the petty annoyances and interferences of vulgar neighbors. Happily for us, such communities are rare, therefore the more easily avoided. The greater advantages of being located near a church, school-house, post-office, and telegraph station, will certainly not fail in receiving their full consideration.

Tastes are so varied, and the objects and aims of individuals so widely different, that scarcely any two will be disposed to select precisely the same spot. Each has some particular wish to gratify. One looks for a situation well adapted to raising the various kinds of fruits, while another is anxious to secure a fertile meadow, for his contemplated stock of improved cattle. I have known a wet marsh to be purchased in connection with a building site, in order to secure an opportunity of gratifying a long cherished desire to conduct experiments in ditching and draining; and that marsh which had previously been utterly unproductive of anything of value, has for many years annually produced immense crops of highly valuable fruits and vegetables; and set an example that inaugurated a new era of enterprise and wealth in the locality. Local associations will sometimes influence a decision; and many persons have no particular choice; but are open to take up a cheap purchase anywhere, trusting to their purse and a kind Providence to bring every thing right in the end.

The extent of property or quantity of ground necessary for a country residence will depend altogether upon circumstances. One acre for vegetables, and another for fruits, will afford a supply for an ordinary family. The quantity devoted to pleasure-ground and lawn will be regulated, to some extent, by the size and architecture of the house; two to four acres will generally be sufficient.

This for a suburban residence might be considered ample. I know of no rule, except individual tastes in this matter. Unless under intelligent supervision, land will not prove very profitable; and where good vegetable markets are convenient, it will generally prove more economical to purchase, than to grow vegetables. Suggestions in this line can have little value, unless specific. To enjoy scenery, it is not necessary to possess it, for he

who is alive to the beauties of the country,

"Can look abroad into the varied field
Of nature, and though poor perhaps, compared
With those whose mansions glitter in his sight,
Calls the delightful scenery all his own.
His are the mountains, and the valleys his,
And the resplendent rivers, his to enjoy
With a propriety that none can feel,
But who, with filial confidence inspired,
Can lift to heaven an unpresumptuous eye,
And smiling say—'My Father made them all.'"

WILLIAM SAUNDERS.

Washington, D. C.

MORTARS.

MORTAR is a cement, resulting from the proper mixture of lime, water, and sand.

Lime, in its technical signification, is common limestone, (carbonate of lime,) deprived by heat of its carbonic acid. This is called lime-burning. Lime is burnt in kilns; the fuel used being, in this country, either coal or wood, as one or the other is more plentiful and cheap. Lime burnt with wood is to be preferred, doubtless, because of its greater purity, and of the less degree of heat made by wood.

Lime recently burnt has a strong attraction for moisture, and for the carbonic acid of the atmosphere; thus, carbonate of lime is re-formed, becoming in time nearly as hard as the limestone, of which it was made. This affinity of lime for water and carbonic acid, is the reason why lime is never found in nature, uncombined.

Lime is the basis of all mortars; sand and water being the other constituents of freshly-made mortar, besides the impurities found in the limestone. The best lime for building purposes is that which contains the least amount of impurities.

The chemistry of mortars is not yet thoroughly understood. A difference of opinion exists, as to the relation, which the constituents of mortar bear to each other. The mortar-bed is made, by mix-

ing together lime, water, and sand, in very uncertain proportions. An opinion has prevailed among chemists, that the silicic acid of the sand combines with lime, as well also as the carbonic acid of the air, and that mortar is a silicate and carbonate of lime. The best authority seems to have determined, that there is no silicate in the mortar, which is a carbonate of lime, mixed with sand.

The sand seems to operate, both mechanically, in giving solidity to the carbonate of lime, and also in facilitating its crystallization; acting as a nucleus. Sharp sand makes the best mortar, offering the greatest number of points for the adhesion of the moist lime, filling it up, as it were, and thus preventing shrinkage. Mortar with a large proportion of sand, shrinks and cracks less than rich mortar.

Mortar, when placed in a wall, hardens first on the exterior, where the atmosphere has freest access—while that in the interior of the wall, remains for a great length of time, uncarbonated, and without becoming hard.

Mortar-beds are but seldom properly made; mostly being left to the ignorance of the "tender," or to the whims of the mason, who generally prefers a mortar rich in lime, because it is easier for him to rend it.

The mode in practice, in this vicinity, is, to form a pool, or receptacle for the

lime, with a ring, or embankment of sand, placed on the surface of the ground, of sufficient capacity to contain twelve or fifteen bushels of lime. The tender then *floods* this lime with water, and when it is slaked, he covers it with sand, mixing it with his hoe, to make up the mortar.

In general, but two or three parts of sand to one of lime are used, thus making a very rich, but a very weak mortar, which will crack, when dry, and require a long time to harden. In general, too, our masons prefer mortar which has been made for a long time: some even contending, that a bed of mortar which has lain all winter, is better for building, than one recently made.

But, when we know, that, as soon as the ingredients of the mortar-bed are brought into contact, a chemical reaction takes place between them, and that new chemical combinations are formed, we must be satisfied, that after these combinations have been formed in an old mortar-bed, the remixing, or breaking up of the bed, is mechanical, and we have little else than a mechanical mixture. It is true, that these chemical reactions take a long time for completion, and that, even after the disturbance and recomminution of the mortar, they may continue, quite to the hardening of the mortar, when spread out in the wall, and in contact with the atmosphere; but, it is equally true, that the mortar will not be as strong, or as hard, as if it had been used when first made.

The most ignorant man must, when he reflects, satisfy himself, that the hardening of mortar being due to chemical combinations, this hardening should take place in the wall, among the stones: the strength of a wall, built of rough stones, of irregular form, is doubtless, to a great extent, dependent upon the strength and hardness of the mortar, and this must be greater, when uninterrupted by mechanical means, than when broken up, after remaining in the mortar-bed

for months, or days, or even hours. The very moment the constituents of the mortar-bed, the lime, the water, and the sand, are brought into contact, by the manipulations of the tender, or mortar-maker, that moment chemical reaction between some of these constituents commences. It is generally conceded, besides this, that freshly-made mortar penetrates the stones of the wall, forming there combinations, which bind the stones of the wall together, so that, after a time, the structure becomes mechanically homogeneous, and is firmly cemented together. What earthly object, then, can there be for delay, in using the mortar when first made, or for making more at a time, than can be used without delay?

Lime has a powerful affinity, or perhaps, more correctly speaking, a ready affinity for carbonic acid. This may be seen, by exposing a clear solution of lime, in water, to the action of the atmosphere. In a short time a white pellicle will form, on the surface of the solution, which is carbonate of lime: this will settle, in the form of a white solid matter, to the bottom of the vessel containing the solution, thus illustrating, in part, the action which takes place in mortar. The carbonic acid of the air, uniting with the lime, solidifies it, together with whatever may be in mixture with it. But, let us collect together this white solid, and examine it; and we will soon be convinced, that it possesses but little activity, and that, if mixed with sand, it will not solidify with any force, but will constitute little else than a mechanical mixture. But, let us take some clear, dry sand, and moisten it with a strong lime water, clear and colorless, and collect the moistened sand into a compact mass, and, in a short time, it will become solid and hard. Every grain of sand will be enveloped in carbonate of lime, and all will be cemented firmly together. Break up this mass, as the mason's tender does with the old mortar-bed, and remix it; and you might as well

attempt to make sand and native lime-stone cohere.

How, then, should the mortar-bed be made up; and how, when made, should the mortar be used?

In the first place, the lime should be used as soon as it comes out of the kiln. It should be placed in the bed of sand, in a layer of eight or ten inches thick, a small quantity of water (just sufficient to slake it) should be applied; and, as soon as the lime falls to powder, a layer of sand (which will prevent the lime from becoming too hot) should be placed over it, and mixed with it thoroughly, and then more water should be added gradually, until, by constant stirring and mixing, the mortar is of a consistency suitable for the masonry. The

proportion of sand to good, pure, well-burnt lime, is five or six parts by weight of sand to three of lime. As soon as made, the mortar should be used; and when sufficiently moist, the water of the mortar, charged with lime, will penetrate into the stone; and a firm union will take place.

The less mortar there is in a mass, in the masonry, and the more closely the stones are placed in contact, the stronger will be the wall.

Some masons put within the wall more mortar than stones, thus adding greatly to the cost, and detracting from its strength.

AN OBSERVER.

December 24th, 1868.

OUR GARDENS OF REPOSE.

"Here is a calm for those that weep,
A rest for weary pilgrims found;
They softly lie and sweetly sleep
Low in the ground."

NO more beautiful idea was ever conceived, than that of laying out, with all the accompaniments of taste, those last resting-places, which living humanity appropriates to the dead. However great the effect of a fine city, viewed at a point to be distinct, we know that it is the living, moving, breathing-place of all that is active in man, whether of virtue, or of vice. The very sounds which come up from its bustling streets have a mixture of harmony and discord in them.

Turn away from this busy scene of the haunts of men; and look down on that tranquil slope, of quiet beauty, where the green-sward, nature's most beautiful carpet, is dotted over with the varied shades of foliage, divided by the labyrinthine pathways, which seem to flow over its surface. Here and there we catch the rising obelisk, or spire;

and everywhere the specks of memory glisten in their white array, as they silently mark the footprints of eternity.

The City of the Dead is as much the study of the architect, as is that of the living; for, the claims of memory are as strong as those of passing life. Build up and decorate our busy temples of commerce, or amusement, as we may, we still owe a memento to the past, for which mortality sues in silence, far more eloquent than words.

Give to the dead a GARDEN OF REPOSE, surrounded with all the fragrance of living flowers, whose sweet incense shall do homage to memory; and those ever-green charms, which should teach the lesson of undying love, unparted by the grave.

The architect will find here ample play for emblematic composition—the very poetry of design. Let him beware of exciting the smile of contempt, rather than the tear of sympathy; for, there is no more trying occasion for the true spirit of his art, than is to be found

here, among the silent dead. In the hurried passing view of his city structure, much that would not bear criticism is passed unseen. But, in the place of burial, the mind of the visitor is calmly resting on every object in its turn; and is in a mood just suited to the study. The architect's design then must be such, as shall convey a pleasing thought, in terms so distinct, as not to admit of any interpretation, foreign to his intention.

Those, who desire to honor the memory of the departed, should be cautious how they seek to do so. Nothing makes a more unpleasant jar upon the feelings, than to see an inappropriate memorial raised above the dead. It at once deprives the moment of its sweet solemnity; and reacts upon the living, who have thus sinned against the proprieties of taste.

We too often see, in our most delightful cemeteries, a want not alone of taste, but of common sense, in the monuments erected, often at a great outlay, to the memory of those, whose feelings, when living, would have been outraged by the very proposition of such a design.

Repetition of emblems, and even of monuments, is tiresome to a degree. There appears a total want of originality of thought, or else a sameness of conception, either of which is unaccountable, when we consider the inspiration, which such occasions so naturally present to the mind of a true artist.

The *broken pillar*, which has become so common, had its origin in the emblematic memorial to a deceased statesman, the pillar of the land. Now it stands over all sorts of people. Urns are so frequent, that their absence would be remarkable. Yet urns were originally used, by heathen nations, to hold the ashes of the deceased, whose whole body, or sometimes only his heart, was consumed by the *pyre*, or funeral pile. Whether such an emblem is in or out of place, over a Christian grave, in this advanced day of ours, may

be a question more classic than profitable. We are of opinion, that Christian faith presents a sufficient number of emblems, to place as memorials, without borrowing from heathen usages.

Pere la Chaise, in Paris, was for a long period the model cemetery of the world. But a better taste has asserted itself, both in Europe and this country. The stiffness of plan of that burial ground has long since given place to the free lines of curvilinear beauty, which make the walks, parterres, terraces, and plats, of our modern cemeteries, so endearing to the taste. The monumental architecture of *Pere la Chaise* is, for the most part, so rigidly classic in outline, and so extravagantly decorated, that the effect becomes positively puerile, and privative of pleasure to the observer. The only feeling produced being one of wonder, at the intense labor of the artisan, and the affluence that afforded such an outlay. These observations might, in the main, apply with equal force to some of the designs in the most beautiful cemeteries in this country, especially GREENWOOD, the just pride of New York.

Now, let us calmly consider the question, as to the policy, as well as the taste, of such florid productions. Are not these quiet GARDENS OF REPOSE truly REPUBLICS OF THE DEAD? Why, then, give an aristocratic prominence to that wealth, which belongs no more to the impoverished worm beneath the pile?

If a nation, or a community, desires to honor the memory of departed worth, let the monument arise in the busy haunts of men. But, in the green solitudes of the thoughtful cemetery, such flaunting pride, as that we too often see, is most decidedly out of place. The graceful tribute of affection is as fully rendered in the faded flowers, as in the pyramid of art. And moreover, the spirit of that equality, which lays the beggar on a level with the prince, is more impartially preserved. There is something very touching in the tribute,

which affection pays to mortality, in the broken flower-vase, so true it is, that

"You may break, you may ruin the vase, if you will ;
But the scent of the roses will cling round it still."

We have seen some very exquisite thoughts elaborated in stone, which conveyed themselves to the mind at once; and without any offensive pride of display, although the intrinsic value was considerable. Such, for instance, as the full length recumbent statue of the *Weeping Angel*. Figures are, indeed, very suggestive; as that of *Hope*, or even as a group of *Faith*, *Hope*, and *Charity*, an *Exhausted Hour-glass*, and a great variety of others of like significance.

In fact, *profuseness* of sculptured display is not to be considered taste, however beautifully executed, when that display has reference to the history of one perhaps undeserving of it, and emanates from partiality of kindred. As such, it must not be expected, that criticism will be withheld by sympathy. But, modest expression of thought in these mortuorial designs is the one great essential, which the architect should ever bear in mind; and urge on his patron, of course, with caution—for this is a point on which the pride of the living is peculiarly sensitive. The architect should also bear in mind his own professional reputation, as well as the unquestionable claims, which the public

taste has on his efforts; and this certainly should not be rejected by him.

Landscape gardening, as well as architectural design, demands a large share of the mental labor required in the laying out of one of our modern cemeteries; and the sculptor's art here takes an attractive stand, for good or evil report. The less pretension in those designs, the better for the artist's fame, for, in large compositions, the chances of failure increase in a fearful proportion.

That there are highly creditable designs, admirably executed, in many of our cemeteries, throughout the country, we do not wish to deny. But, that there is a vast amount of vapid nonsense is, unfortunately, but too true. It is a subject of growing importance, this laying out, and decorating in fitting taste, the Gardens of Repose, where the loved ones rest in silence, and wakeful Memory presides over their sleep.

We invite our professional brethren and others to favor us, from time to time, with suggestive sketches of Monumental designs; and we pray the public to deal cautiously with this delicate subject; and not trust the testimonials of their affection solely to the rude hands of the mere stone-cutter, who is but too apt to repeat his one idea *usque ad nauseam*.

We will return to this subject on a future occasion.

MODERN HOUSE-BUILDING.

THE civilization of the human race, creating established forms of government, guarantying safety and protection to all the members of society, has worked a complete revolution in the buildings necessary for the comfort and habitation of man.

In the ancient feudal days, each man's dwelling or castle was erected more particularly with a view to strength and security, sufficient to resist the attacks

of any force that might be brought to bear against it. The insecurity of the times, the want of protection afforded by any controlling power, compelled each man to make his dwelling a stronghold, from which he issued forth, to war or prey upon his neighbor, or to which he retired, to defend himself and retainers.

The adjuncts of most ancient castles, their moats, draw-bridges, portcullises,

towers, battlements for archers, and dungeons for prisoners, have long since passed away. The history of brave men, in predatory warfare, furnishes materials for romances suited to shadow forth the age in which they lived, Ivanhoe, the Black Knight, *Front-de-Bœuf*—all types of the times of the Crusades—and the sanguinary battle waged to destroy the castle of *Torquilstone*—described as almost impregnable—have been made immortal by the pen of Sir Walter Scott, throughout all whose works are graphic descriptions of the dwellings of that age, which made great pretence of civilization, yet failed to give safety and security to the people.

It was this great danger and risk of life, that caused each man to build for himself a fortress. Inhabitants of cities encompassed themselves with walls, always well guarded and manned, to protect them from invasion and surprise. As the arts and sciences advanced, the population of countries became more orderly; government more secure; and the subjects of monarchies were guaranteed safety. Then it was, that people commenced to live, without fear of each other, and the character of dwelling-houses changed from that of the fortalice and the prison to that of the building erected for comfort and convenience. Heavy, rude, and cumbrous architecture gave way to a lighter style, with more utility and less strength and massiveness; built only to resist the inclemency of the weather, and not blows from a battering-ram. Then windows were first made for light, and not for loop-holes to discharge arrows from. The peaceful character of the times and people caused these changes to follow each other rapidly. The glory of the feudal ages departed, and man seemed again a primitive being. Instead of the warlike castle, the hamlet, in which our rude forefathers dwelt, shed its peaceful serenity o'er the scene.

Houses have always been built in accordance with the tastes and means of

the owner, and according to the prevailing style of architecture. In Rome and Venice, the nobles of the Middle Ages impoverished themselves in erecting palaces, while the poorer classes lived in hovels. It is the system of house-building, which, in these modern times, erects comfortable and convenient homes for the middle classes and the poor, that is the great achievement of the age in which we live; while at all periods since the creation of the world, the rich could be as well housed, as the age in which they lived afforded, yet the poorer and larger class of society were but indifferently provided for.

We, free people of America, can hardly appreciate the old system of nobility and retainers. The dependent state of vassalage is repugnant to our ideas of independence; and the poorest man in this country seeks eagerly for a home of his own. It is this earnest desire to be free and independent of landlords, or of any other system of tributary bondage, that has brought into active life the enterprising energy of mechanics and others in this Nineteenth century, interested in building houses for the masses.

The population has increased so rapidly in Philadelphia, and the demand, for dwellings, these last few years, has been so great, that a stimulus has been given to the house-building business. With superior advantages of pure drinking-water, gas, sewerage, healthy location, and pleasant climate, this city stands unrivalled for private residence; and I do believe that houses, for all classes, can be procured here, at far less expense, than in any other city, of the same size, in the world. Modern house-building has approached such a degree of perfection, that the poorest man, if he can only pay one dollar per week, can very soon possess himself of a comfortable and respectable house.

The building of one house, for a residence, by a gentleman of means, or of several, for investment, is a matter of

such usual occurrence, that it is not worth while to dilate upon it; but the taking up of acres of ground, and the building it up solid, in a few short months, with houses of various sizes, is an achievement, that, a few years ago, would have been thought as impossible as were once supposed to be the triumphs of the steam-engine and the telegraph; which have since demonstrated, that the mind of man is divine, and possessed of a subtle essence, enabling it to make tangible visions of greatness and power seemingly miraculous.

The characters of large districts have been at once defined, by one builder, erecting several hundred houses. He starts a city of his own; and decides what class of residents he will have.

Extensive operators, generally in connection with some well-known capitalist, purchase, say from five to ten acres, in ground convenient to the centre of the city, and arrange to erect upon it, say from fifty to one hundred houses, each season, until it is all built up. The lot is divided by the city streets. Upon the main ones, houses of as large size as the neighborhood will warrant, are built; and, upon the by-streets, smaller houses are erected, thus affording houses for all classes of society. No house is built upon a street less than twenty-five feet wide, thereby affording ample means for ventilation, drainage, water, gas, and travel.

All houses in Philadelphia are built under the direction of the Building Inspectors; and in accordance with the law, provided by Act of Assembly, which insures sufficient strength, according to the size of the house; and as much protection as possible from fire. The streets are all paved and curbed. Water, gas, and ample sewerage are introduced into each house, no matter how small; and all the other luxuries of building, as the style of the house may warrant.

The immense amount of money required, to carry such an operation through successfully, is obtained in a

very simple and easy manner, providing the parties have sufficient confidence in one another; for, like every other transaction in this life, from the cradle to the grave, building houses is based on faith.

In the first place, the value of the land is decided; and apportioned upon each lot. The owner of the land then agrees to loan the builder a certain amount of money, generally about one-third the cost of erecting a building of the size determined upon; which amount is advanced to him, in instalments, as the building progresses. To secure, to the owner of the ground, the price for the lot, and the money advanced, the builder gives the land-holder a mortgage for the two amounts together, usually aggregating about one-half the value of the lot and house finished. This mortgage is made payable after a term of years; and, being a good security, is recorded before the buildings are commenced. This gives it a priority over mechanics' liens, and makes it, in the hands of financiers, an available asset. Now this being done, it is the builder's next object to bring about him able and responsible mechanics—men to assist in carrying out his scheme—and proper materials. In other words, he organizes a huge partnership, in which each operator in the houses takes whatever interest in the houses may be agreed upon, and receives a certain share of the cash, as the work progresses. It is in this partnership, that the greatest faith must abound; for, if confidence in the truth and honor of the builder is destroyed, the whole concern must end in disaster and ruin. The operation being one of large and extended credit, the integrity, as well as the ability of the builder, is a matter of the first consequence. In the early days of such enterprises, bad faith seemed to abound; many frauds were committed; and the whole system fell into disfavor; but, later, when it came to be better understood, and managed by able men, it was found to be the only way to solve the

problem: How to provide houses for the million. Now—supposing the operation successfully carried through: the houses are all finished; and ready to occupy: the partnership commences to dissolve of its own accord. All the accounts are adjusted: the title is made to each of the partners, for whatever houses he has agreed to receive; and all the various parties concerned sign their releases, one of and for the other. If, when the last is done, it is found that the builder owes any unpaid balances, they are charged against the houses remaining in his hands, which are those he has left to show, for the amount of capital and time he has invested in the operation, and embody his profit. These balances are divided equally upon such remaining houses, which are liened, as security; and, as they are sold, these debts are finally liquidated.

Now the concern is wound up: the houses are in the market, to rent or for sale: many are occupied by the first owners: the rest are sold upon such easy terms, that, in Philadelphia, it is the simplest thing in the world for an economical family to own their house. The first mortgages, before mentioned, given for the land and advance money, are made for a term of years; and are generally sold by the capitalist to savings and insurance companies, to realize money to turn another operation. The builder sells any particular house, subject to its respective mortgage; and takes one-half the balance in cash, and one-half in a mortgage payable in instalments, making it a very easy matter for the purchaser; and providing himself assets, with which he can liquidate his liabilities. All of these "second mortgages" can be used and sold; for, after all, the experience of our best busi-

ness men has taught them, that real estate, ground-rent, or mortgage security, is the best and safest to hold. A steady interest of six per cent.—the principal being fairly secured and subject to no probable fluctuations sufficient to impair its value—is what man can sleep soundly upon. It is the firm basis of a fortune, with no uncertain tenure, as is the case in the rise and fall of stocks. No broker, or speculator, can get up a corner, or create a panic, in mortgages and ground-rents, as long as our government guarantees security to person and property.

Now this is the system of managing most modern house-building—a system under which some of the finest houses in this city are built. Many people have an idea, that the houses, built in this way, are not as good as if built by contract. A man may, perhaps, finish one house better, than he can a hundred, because he can pay more attention to minor details, but, in the main, he can build it no better. The best and most responsible mechanics are employed; and the work, although pushed rapidly, is well done. The same character of work is done, by the same men, in contract houses; and you can see no difference in any two houses of the same price, the one built by this system, and the other by contract, except this: that the contract house has cost twenty-five per cent. more; and is not built or finished any better.

There is no city in the world, perhaps, that understands and practices this system of building, as Philadelphia; and all mechanics and dealers in materials accept it, as the most legitimate business, when operated by good and reliable men.

H. M. B.

CEDAR; AND ITS RELATIONS.

WE need offer no apology, for extracting, entire, from the LONDON "BUILDER," for the month of July, 1868, the following very able and exhaustive article on "CEDAR AND ITS RELATIONS." The writer has so thoroughly reviewed the whole subject of the various uses to which this wood has been applied, from the earliest days of history, down to our own times, that little remains for us to add.

With relation, however, to the particular use, which he advocates, on the ground of its having been similarly employed by the ancients, viz.: that of Book-shelves and Cabinets, we have found mention of a lecture, delivered at Edinburgh, Scotland, in 1852, by the late Dr. Fleming, the Professor of Natural Science in the College of that city, in which the Doctor stated, that from his own personal knowledge, and from the result of inquiries he had instituted, he had come to the conclusion, that "none of the resinous firs and pines, as well as junipers, (which yield the wood usually termed Cedar,) can be safely employed in the construction of drawers for the reception of objects of Natural History." He had come to this resolution, from having personally observed, that articles and specimens kept in cabinets made of Cedar wood had become coated with a sticky gum, difficult to remove, and having a strong aromatic odor of Cedar, owing to the resin of the wood having become evaporated and condensed on the surfaces of the contents of the cabinet. In the case of one containing watches, much serious damage was occasioned, it having been found, that the oil had been converted into a species of gum. From this, he is of opinion, that the advantages which Cedar undoubtedly possesses, from the aromatic odor of its resin preventing injury from insects, are neutralized by the injury done

by the presence of this very resin, itself, on the objects to be preserved. He proceeds to state, that he "can testify to the *White American Fir* possessing all the desired qualities, being perfectly innocuous in itself, and proof against dry rot or the influence of moisture;" it is also, in a remarkable degree, free from resin, in comparison with other firs and pines. The Professor here alludes to the "*Pinus Strobus*," widely known, throughout Canada and the United States, by the name of *WHITE PINE*, from the perfect whiteness of its wood when freshly exposed; and recognized, in the different States and provinces, by the local names of "*Pumpkin Pine*," "*Apple Pine*," and "*Sapling Pine*."

The wood of this species is employed in greater profusion, and in more varied uses, than that of any other American Pine; and, yet it has its own, very striking and well-known defects. It has little strength; gives a feeble hold to nails; and is apt to swell, under the influence of the moisture in the atmosphere. These disadvantages are, however, fully counterbalanced by the superior properties which it enjoys. It is soft, light, free from knots, easily wrought, very durable, not liable to split from exposure to the sun, and can be obtained in boards of great width, and spars and timbers of large dimensions.

We can here enumerate only a few of the diversified uses to which it is put throughout the United States; such as the ornamental work round the outer doors of our buildings, cornices, and friezes of apartments, mouldings of fire-places, &c., the inside of mahogany furniture and of trunks, the bottoms of Windsor chairs, water pails, packing-boxes for goods, shelves for stores, barrels to contain salted fish; some of our finest bridges; masts and yards for our shipping, clapboards, shingles, &c.

The precious qualities, and varied uses, of WHITE PINE, have been fully appreciated in foreign countries; hence, much of it is exported to Europe and the West Indies, where the consumption is very large.

(From the LONDON BUILDER, for July, 1868.)

In pointing out some of the practical purposes to which cedar is applicable, we must, of course, give the first place to Carpentry. Such uses, in ancient times, were confined to the Oriental nations: and, in our own times, with the exception of Japan and some of the islands of the Indian Archipelago, to the Continent of America. The boundless forests of the Amazon and the Mississippi supply, as we have seen, much larger scantlings of the timber, than could ever have been obtained from Lebanon. Nevertheless, it is to Lebanon we must go back for the highest illustrations of its original, and most magnificent applications to the purposes of building.

Sir Christopher Wren had a curious hypothesis, with regard to the construction of the temple of Dagon by the Philistines. This was probably a quadrangular pile of buildings, having a court in their centre; but he conceived, to himself, a vast roof of cedar beams, resting at one end upon the walls, and centering at the other upon one short architrave, that united two cedar pillars in the middle. Such a method of construction would, doubtless, render the celebrated feat and dying effort of Samson intelligible; but this view, as we have said, was entirely an hypothesis. It is to the minute and graphic narration, which is furnished by the sacred historian respecting the building of Solomon's temple, that we must look for the earliest authentic account of the carpentry of this valuable timber. [1 Kings v., vi.; and compare 2 Chron. x.]

We need not recapitulate the details of that ancient and honorable contract, which Solomon made with the King

of Tyre. Let us call attention to one or two of its features, which are still worth the attention of our modern political economists. In the first place, the wise monarch makes no attempt to conceal the want of "technical education," on the part of his own subjects. "For thou knowest there is not among us any that have skill to hew timber, like unto the Sidonians." At the same time, although the pastoral tribes of Israel could not hew timber, they had plenty of corn and oil, which they were willing to exchange for this architectural skill. In order to see, that this exchange was equitable, agreeable, and profitable to both parties, let us simply note the result. "And there was peace between Hiram and Solomon; and they two made a league together." Is there any thing, we should like to ask the question, so antiquated in this simple but sacred principle of those ancient Syrian monarchies, that the governments of modern Europe and America could not find it their interest to act upon it? In the second place, although Solomon did not set his subjects up as skilled artisans, equal to those of Tyre and Sidon, he made no difficulty about supplying a host of inferior laborers, "three score and ten thousand that bare burdens, and four score thousand hewers in the mountains." This is a lesson in the division and *subordination* of labor, that might be usefully taken to heart. * * * * * Once more, we are told, that Hiram delivered the timber and stonework in a finished state; "so that there was neither hammer nor axe, nor tool of iron heard in the house, while it was building." The circumstances, in fact, were these: The river Adonis was in the vicinity of the forest of Lebanon; and discharged itself into the Mediterranean Sea, near Biblos. Accordingly, Hiram could transport the timber, all squared; and, not only cut to scantling, but cut so as to fit the place each timber was to occupy in the building. From Biblos, those rafts might easily be sent down

the coast; and landed at Joppa, the nearest port to Jerusalem. On this most singular circumstance, we will only remark, that Solomon, with all his wisdom, would not have been able to do such a thing,—at all events not in England,—in the Nineteenth century. Our wise carpenters, bricklayers, and stone-masons, have far too much good sense, to permit their timbers to be worked in the forest, their stones at the quarry, or their bricks in the field, even although it can be demonstrated, that the builder would obtain a better article, save much time, and the cost of transporting superfluous materials. Whether they are wiser, in their generation, than Solomon, is a question which we will not stay here to determine.

To proceed. The roof of Solomon's Temple was constructed with beams and boards of Cedar, as well as the lining, or panelling of the walls, and even the foundations. We must always remember, however, that the Eastern customs of construction, respecting the roof, are very different from our own. We construct our ceilings with plaster, and our roofs with wood. They, on the other hand, constructed their floors of plaster, or painted tiles, and their ceilings of wood. As to foundations of timber, these, of course, are only possible in a dry, porous, sandy soil, such as that of Palestine. We need not dwell on the Cedar ornaments of the Temple; indeed, the whole timber used, even to the most minute finishing or decoration of that celebrated Temple, was composed of Cedar. The altar was of Cedar overlaid with gold; the oracle was of Cedar; "and the Cedar of the house within was carved with gourds and open flowers; all was of Cedar; there was no stone seen."

Cedar timber, thus so lavishly used by David and Solomon, in their buildings, was also, we read, used in the second Temple, rebuilt under Zerubbabel. The Cedar employed was Cedar from Lebanon, (Ezra iii. 7.) Cedar is also

said, by Josephus, to have been used by Herod, in constructing the roof of his temple. And the roof of the Rotunda of the Church of the Holy Sepulchre, at Jerusalem, is said to have been of Cedar; and that of the Church of the Virgin, at Bethlehem, to have been of Cedar or Cypress. Nor was the use of this famous tree always confined to the purposes of house-building; it was sometimes employed, we are told, even in ship-building. The Prophet Ezekiel tells us, (xxvii. 5,) in that valuable historical account of the ancient Phœnician commerce then at the period of its greatest prosperity, (B. C. 600,) that the Tyrian ship-builders constructed their ship-boards of the fir-trees of Senir, and their masts of the Cedars of Lebanon.

It should always be remembered, however, in speaking of the Cedars of Lebanon, used in building by the ancient Jews—particularly when beams, pillars, or ceiling-boards are mentioned—that it is extremely probable, the wood of more than one tree was employed. The generic name, indeed, of the tree was used. But under that name (*Pinus Cedrus*) were also (as Dr. Boyle has shown) comprehended the *Cedrus Deodora*, the Yew, (*Taxus Baccata*?) and the Scotch pine, (*Pinus Sylvestris*.) The latter tree might have furnished the material of the ships' masts, mentioned by Ezekiel, which recent commentators consider was the case.

In our day, the chief consumption of Cedar, for building purposes, lies in the States of South America. There is a species of *Cyprus*, called White Cedar in the Brazilian territories, which is valuable timber; and in Bermuda, and other islands of the West Indies, a brown quality of wood is much employed. The tree gives the name to a range of hills called the Cedar Mountains, in Cape Colony, which supply the township of Clan Willans, and its neighborhood, with planks for building. It is very little known in Africa, although the Cedar of Algiers is compact, very dura-

ble, and said to be susceptible of a high polish. But the Japanese employ a species of cedar, which, however, Thünberg describes as a kind of Cyprus, a beautiful wood, that lasts long, without decay, in building bridges, houses, and even ships. Cedar is now seldom employed in England, or the Continent, for building purposes, although there is a species, indigenous to Spain, and the south of France, which possesses many of the essential requisites. Indeed, there seems to be a great difference between the various qualities of Cedar, as there is between the Scotch Fir and the Norwegian Pine; and it is obvious, that the ordinary tables of strength of materials must be grossly defective, when they speak of Cedar as representing a constant quantity, as most of them do. The fact is, in many of its physical qualities, particularly in its powers of resisting strain or compression, it is much inferior to the most ordinary description of Yellow Pine. It is seldom fine-grained enough, or sufficiently compact to take a high polish, and the green timber is extremely prone to crack and rend, in the process of drying. Its color, indeed, is varied, and often beautiful, and its capacity for being easily worked is very great. But it possesses one simple feature, which distinguishes it, and gives it a value above all other trees of the pine tribe, and that is the important quality of durability. Pliny tells us, that the durability of Cedar was proved by the duration of the Cedar roof of the Temple of Diana, at Ephesus, which had lasted four hundred years; and at Utica, the beams of a Temple of Apollo, constructed, however, of Numidian Cedar, lasted four hundred years. It was on this account—*propter returnitatum*—that Vitruvius recommended it to be employed in the construction of temples, and other public buildings, and, particularly, in the formation of statues to the immortal gods. It is not so much prized for those sacred, or ecclesiastical purposes in the present day; but that is not

owing, as we shall see, to its properties of durability.

This unrivalled quality is, undoubtedly, owing to the essential oil of its resin. The wood, cones, bark, and even leaves of the best species of cedar, are saturated with resin, of a peculiar and powerfully aromatic odor, a slightly bitter taste, and a rich yellowish brown color. It renders the timber proof against the attacks both of the worm and the moth. This cedar resin, which is sometimes called *cedrin*, flows spontaneously from the trunk, upon incision. It somewhat resembles mastic, and was often used by the ancients, along with other aromatic gums and resins, in the embalming of the dead. It was burnt, as a perfume, at the funeral pyre; it was also used in certain diseases as a medicine.

It is proper to mention, however, that Pliny, to whom we are indebted for these facts, comprehends under this name the lesser Cedar, (*oxycedrus*), or Phœnician Juniper, which is still common on Lebanon, and the resin of which is also aromatic. Cedar oil, a kind of turpentine, was likewise prepared from the wood, and was applied to the rolls of papyrus, in order to preserve them. Hence the celebrated sentence attributed to Persius, that in order to deserve fame, one should leave words, which were worthy of being preserved in Cedar! The resin, or oil of Cedar, is almost unknown in the present day. We wish it were otherwise; for, in that case, we might present a striking contrast to some (most, indeed) of the modern chemical processes of the destructive distillation of resin. The Essential Oil of Cedars, we may add, belongs to a family of hydrocarbons, which are all celebrated for their antiseptic properties. The Oil of Juniper, the Oil of Cloves, the Oil of Nutmeg, and some others, belong to the same family, of which, however, the most perfect chemical type is the Essential Oil of Bitter Almonds.

The next important purpose, to which the timber of Cedar is applied, must

come under the wide category of interior decoration. But to whatever extent it may have been applied in this direction in Eastern countries, it cannot be said to have taken root in Europe. For wainscot or paneling, it cannot be compared, for a single moment, with Oak, or even, in certain respects, with Red Pine. The fact is, being a very porous wood, it is liable to absorb moisture, and so become extremely sensible to changes of temperature; in other words, to split and crack. Although it is very easily cut, it does not preserve its form when wet; and, besides, we are half of Mr. Ruskin's opinion, that carving in Cedar is too easy to be valuable. Some of the American river steamers, we are informed, have their large and handsome saloons fitted up with Cedar, carved and heavily gilded; but even here it cannot compete with Mahogany. Certain Mediaeval Greek Churches, as we learn from the Ecclesiastical historians, had their rood-screens, and sometimes their altars, constructed of this material; but it was seldom or never employed for the sedilia, or other internal fittings. The best example we remember to have heard of with regard to the application of cedar to interior decoration, was a very handsome library, fitted up in the Cinquecento style, by the late King of Bavaria; but, whether the material was derived from Lebanon, or from South America, we do not, at this moment, recollect. No doubt but, for this purpose, Cedar is a highly useful and proper material. Bookshelves, constructed of Cedar, would have the very same conservative influence on books, that Russia leather binding exercises, and their common effect springs from the same cause—in each case, from the antiseptic properties of the oil. Besides, as we have seen, there is the antiquity of the practice to recommend it. If the ancients kept their writings in cabinets of Cedar, why should we moderns not follow their example, with regard to our books?

We must not overlook entirely, in our

cursorry survey of the subject, the tablets of Cedar mentioned by Vitruvius. These consisted of wax tabulæ, that were written upon with a stylus, and furnished with timber backs, and raised mouldings on the front edge, either composed of Citron or of Cedar. The wood tablet used by the Prophet Isaiah (iii. 22,) signifies perfume boxes. In Hebrew, it is literally "houses of the soul or breath." Many Eastern women still wear an ornament composed of Cedar, resembling a house or temple, containing a small image, obviously at once a symbol of purity and of devotion.

If we wished to institute a comparison derogatory to our modern sentiment, we must refer to the very popular application of Cedar to the manufacture of cigar boxes. The boxes in which Havana cigars are usually imported, consist, however, of a very common tree, a native of the West Indies, known, in the trade, as the Barbadoes Cedar. It reaches often to the height of eighty feet, and its trunk is remarkable for its circumference. The cones, bark, and leaves, have a bad smell, resembling that of assafœtida; but the wood has an agreeable fragrance. Enormous quantities of the timber are annually consumed in the form of cigar boxes, and light packing cases, and it is sometimes used, in France and Germany, in making the cheaper sorts of black lead-pencils. This tree (*Cedrea odorato*) is so common and plentiful in the West Indies, that it is used for the most ordinary domestic purposes, such as shingles, and it has been even applied by the natives to the construction of their canoes.

The next, and probably the most important modern application of Cedar, we shall notice, is that of furniture. And here the same principles, of which we have already spoken, will govern the extent of its consumption. It will not make a good chair, but will make an excellent work-box, or dressing-case. It could never, we think, supersede Mahog-

any, as a table or side-board; but it will make a splendid wardrobe, and the best of all book-cases. It must always be remembered, that the value of Cedar resides in its virtue of resistance to the parasites, which infest other timber; its general antiseptic properties; its pleasant odor, and its light agreeable tone of color. We understand, that Messrs. Morrison, of Edinburgh, under the direction of Lord Lindsay, have ingeniously contrived a description of wardrobes, in which the best features of Mahogany, Rosewood, or Walnut, are combined with an interior skeleton of Florida Cedar, thus uniting the properties of both woods, in the same article of furniture, and we can easily imagine, that the conception is a sound one. The lining of wardrobes and drawers with Cedar, however, is of old date in Scotland. As a material for furniture, *per se*, Florida Cedar is by no means the best. That which is imported from the Northern States, although possessing less perfume, is harder, more susceptible of polish, and capable of standing greater wear and tear. This species of timber is also the best adapted for the cases of pianofortes, although we cannot admit, that Cedar is the best, or even one of the best, forms of timber, for this trying purpose. Some of the finest specimens of Cedar, that can be applied to furniture, or such like purposes, may be seen in the Museum, at Kew Gardens; and we may add, that we saw in the Paris Exhibition, several highly creditable examples of light Cedar bed-room furniture, for which purposes we think it will be found highly suitable. Its chief consumption, at this moment, however, consists in the lining and interior fittings of drawers, wardrobes, side-boards, and tables; in which respect it is, owing to its low price and abundance, gradually superseding Oak, and even Black Birch. As we have said, it will never stand comparison, by itself, with Mahogany, or Black Oak, for dining-room furniture,

or with Rosewood, or Walnut, in that of the drawing-room. But, in the library and the bed-room, there are grounds for believing, that Cedar furniture will gradually obtain a principal place.

The last, and certainly not the least important application of Cedar, is that of its use in the manufacture of black lead-pencils.

On this head, we shall be brief. We shall just state here, that its adaptation to pencils is three-fold. First, its freedom of manufacture; Second, its pleasant perfume; and, Last, its property of easy cutting, along with the lead. Keswick pencils are worthy the produce of Florida Cedar; and the kind which is best suited for the purpose, is the free, quick-grown wood; there is a harder sort, of slower growth, which is more fitted for the purposes of furniture. The Red Cedar, so well known in the pencil trade, some twenty-five years ago, was chiefly derived from the Virginia Cedar, which is, in fact, a Juniper, (*Juniperus Virginiana*.) Like the Cedar, these Junipers are distinguished for their resinous qualities, and have been also applied to furniture and other purposes, but the chief consumption of their wood was in pencils.

We began this article, with a description of the Cedars of Lebanon, and we conclude, by once more expressing the hope, that these splendid historical trees will not be allowed to become extinct. Here, after all, resides the poetry of the subject. There are other woods, such as Spanish Mahogany, and Walnut, which are more beautiful in their color. There are some, too, such as Rosewood, and Sandal-wood, which are possessed of a stronger fragrance, and a more agreeable perfume. But no other tree carries back our associations to the time, when Solomon, in all his glory, ruled the destinies of Israel, and no other was thought fit to be applied to the sacred purposes of the TEMPLE ALTAR, and the "COVERING OF THE CHERUBIM."

T E R R A C O T T A .

THE literal meaning of the term "Terra Cotta," [from the Italian,] is "baked earth," which most expressively and simply asserts the nature of a material that has been known and used for the past two thousand years; and, in our time is applied to an amazing number of varied purposes. That it was employed by the Romans and Greeks for statuary, bas-reliefs, vases, tiles, and architectural ornaments, ample evidence is found in the numerous valuable collections, which are contained in the museums of Europe.

Pliny, in an old and well known legend, gives the credit of the discovery of the art of modeling in clay to a potter named Dibutades, in Corinth; but although the tale, as told by Pliny, is very poetical, it is not supported by any proofs. On the contrary, we have abundant evidence, that the art was known long before even Corinth was heard of, as it is indisputable, that the Ancient Egyptians used baked clay in forming the small figures, which have the appearance of household gods. That the productions of works of art in this material were also common to Greece, is seen from numerous allusions in Pausanias to different examples in his country; for instance, a temple at Athens, which contained a number of statues in clay, and another of which the roof was ornamented with similar statues. And, in another place, the remarkable fact is incidentally obtained, that the Athenians were in the habit of having annual exhibitions in public, of the best works of art in clay.

Italy also affords numerous and beautiful examples, evincing the high standard to which this art has been elevated; and among the Etrurians and Romans, Terra Cotta decorations were most lavishly employed, on their temples, tombs, and other buildings.

The best collections of Terra Cotta in Europe, are acknowledged to be those of the British Museum in London. They are of immense and invaluable interest, in the antiquity of their specimens, the high degree of artistic skill which they exhibit, and the evidence which some of the bas-reliefs afford of the occasional imitation, by Roman artists, of subjects drawn from Egyptian sources.

The Royal Museum at Naples, contains statues in this material as large as life, a very unusual size for a substance comparatively so fragile as baked clay.

The use of terra cotta in statuary, or what is more generally known as Ornamental Terra Cotta ware, has been of late years brought to great perfection; and forms quite an important branch of art.

In America, it has only been practically known for about twenty-five years; and the rapidity with which it has risen to its present magnitude speaks volumes in favor of the ever-increasing love of the artistic and beautiful; the cordial support and encouragement given, by the great mass of our people, to the fine arts; the consolidation of society, and the augmentation of wealth—all of which are the most striking and pre-eminent characteristics of the present age. It is only at comparatively a very recent date, that Americans began to turn their attention towards, and to feel an interest in, the beautifying of their residences and grounds; and, in fact, to learn the value and importance of rendering home attractive and enjoyable. To this end, Terra Cotta ware is specially adapted, from its placing within the reach of almost every one imitations, in this plastic substance, of some of the most exquisite works of ancient art, such as statues, vases, bas-reliefs, &c., for the embellishment of Houses, Lawns, Cemeteries, Public Parks and Buildings.

A spirit of emulation and of ambition seems thoroughly aroused in the minds of our people, with regard to the decoration and embellishment of our homes and our grounds; and everywhere we are struck by the beauty and artistic skill lavished on the elegant and chaste designs for Statuary, Rustic Vases, Flower Pots, and Pedestals met with, in our public and private gardens and cemeteries.

But ornamentation alone is by no means the sole use to which Terra Cotta has been and is still put. As we have before said, its several applicabilities are numerous, we will briefly here enumerate some of them. And first, perhaps, in point of antiquity, we may refer to its availability, as a material for forming drain pipes. That it constitutes a most durable and serviceable drain will hardly, we think, be denied, when we remember the fact, that sewers built of it have been discovered in the excavations at Herculaneum and Pompeii, in an excellent state of preservation. As these ancient cities of Italy were overwhelmed, by an eruption of Vesuvius, in the year A. D. 79, we may safely infer, that the practice of using this material for drain pipes was known to the ancients long before, as we can thus trace it, for from 1800 to 2000 years.

In America, it is comparatively new; and for a long time we were dependent entirely upon England for our supply; but—as its merits gradually became more appreciated, and new applications for which it was capable discovered—the demand became so extensive, that a Terra Cotta manufactory was established in Philadelphia, by S. A. Harrison, No. 1010 Chestnut street, to meet the steadily increasing demand. From a small beginning, made by Mr. Harrison in 1850, his works have now assumed colossal proportions, occupying, at the present time, an entire block, the operations of which are carried on by the aid of patent improvements of his own invention. His example has been followed

by many others; and Terra Cotta drain pipe manufactories are now becoming institutions in our country. Being the most thoroughly vitrified pipe of any in the country, his are most suitable for the purpose of drainage, the smooth glazing, which is one of their peculiar properties, being the result of the positive vitrification of the mass, and not a mere superficial layer of what is called lead glazing, similar to that employed on common red pottery, which is readily acted upon by chemical agents, and sewerage water. These are made in all sizes, from two (2) to fifteen (15) inches bore, with bends, branches, traps, &c.

Another use of Terra Cotta is in the manufacture of chimney tops, plain and ornamental. From the ease with which the material can be moulded into any shape whatever, its adaptation to this particular branch of constructive detail is extremely felicitous. They are executed in the most architectural and artistic designs, beautiful in proportions, producing a striking and picturesque effect; and have become of almost universal adoption, wherever obtainable. They are impervious to the action of frost, and to the strong gases emitted from coal, so destructive to brick chimneys. They have rapidly taken the place of the latter, and have successfully stood the severe tests to which they have been applied.

We will now proceed to another use, and that a very important one, to which this material has been applied, viz., as flue-pipes for smoke, hot air, ventilation, &c., in the construction of buildings. It is superior, for such purposes, to the corroding and expensive iron and tin flue-pipes, which have so long been employed; and being, to a great extent, a non-conductor, there is less loss of heat, and the building is secured from damage by fire. It possesses another advantage, that it can be built in a six-inch partition, thereby occupying much less space, than the old style of flues. These flue-pipes are manufactured in lengths of eighteen (18) and twenty-four (24)

inches, and of any desired shape, for angles, curves, &c., and plain, straight, with register openings, or pipe-holes. The superiority of these flue-pipes cannot for a moment be disputed. They are easily built in the wall, being capable of starting from any portion of the building, with all due efficacy and durability, and indestructible, when once set; and the slight additional original cost is so trifling, that it cannot be weighed, against numerous compensating qualities.

We have deferred unto the last, a few remarks upon the applicability of Terra Cotta to architectural purposes, such as for caryatides and mouldings, cornices, vases, and delicate ornaments. That it is well suited for such purposes, there can be no reasonable doubt, from the test, of upwards of half a century, of many specimens, which are to be seen—for instance—in St. Pancras Church, London, Greenwich Hospital, Somerset House, and St. George's Chapel, Windsor. To show its durability, as compared with stone, we may point to the statue of Britannia, on the Nelson Monument at Yarmouth, where actually the stone, of which the pedestal is

formed, is rapidly yielding to the effects of the exposure, while the Terra Cotta statue remains intact, as clearly defined, as it was when it came out of the kiln. There is no question, therefore, as to its quality of durability.

Its strength, also, has been tested, and proved to be very great, indeed. By the hydraulic machine, that raised the tubes of the Britannia bridge, over the Menai Straits, in England, it was found that a cubic foot of Terra Cotta stood a pressure of four hundred and sixty-four tons.

It also possesses another recommendation—and one which is an all-important one on many occasions, viz: the great economy, both of time and money, which can be effected by the use of Terra Cotta for many purposes, such as bas-reliefs, enriched and moulded work, now executed in marble and stone, at a much greater cost. We think we have said enough, to draw the attention of our professional men, more to a subject, which has not, as yet, we venture to think, here met with that consideration which it deserves in the United States, while in Europe it has not been overlooked.

CHIMNEYS.

TO those who have examined the ancient castles and dwellings of Europe, it must have been apparent that the architecture of the days in which they were erected did not seem to comprehend chimneys; an omission which, in our day, would be considered very serious, and which, in that day, must have arisen from total ignorance of their use. In those castles and mansions, even in the royal palaces, the fireplace—that region of domestic comfort now—was a *terra incognita* then. The brazier, in which charcoal was burned, answered the purpose of heating.

The earliest allusion to the subject is to be found in the Scriptures. Jeremiah, (xxxvi. 22,) speaking of the gather-

ing of the princes, at the desire of the king of Judah, on a particular occasion, he says that he, the king, sat in his winter house, and that there was a fire on the hearth burning before him. The generally received translation of this word *hearth*, is a place for the fire, which might mean a movable burner, as well as a stationary hearth in connection with a flue. It is more than probable that a *brazier*, containing coals, was meant, for it is evident that no chimney was used. This was six hundred and five years before Christ. In those puzzles to antiquaries and historians, the Round Towers of Ireland, erected, more than probably, for the preservation of the sacred fires of Druidic worship, over

two thousand years ago, there is no chimney to the fire chamber in the top; the smoke finding egress through four loop-holes facing the cardinal points, which holes were, perhaps, devoted solely to such purposes; for, that this top chamber was for the keeping of fire, is seen in the smoked state of the stone floor in each of those towers.

In England no evidence of a chimney can be discovered previous to the twelfth century, when we find a flue occasionally in Rochester Castle, and other remains of that time; and those flues were not carried up to the roof, but found vent in one or two *smoke-holes* in the outside of the wall. It was not till the fourteenth century that the *chimney shaft* made its appearance; and after that period the chimney has a decided history in Domestic Architecture. In Elizabeth's time the chimney shaft became a distinguishing feature in the Architecture of that period.

Though chimneys are found in some parts of Asia, as in the north of Persia, yet, generally, apartments are warmed in cold weather by means of pans or braziers of various kinds, and either of metal or earthenware, which are set in the middle of the room, after the fire or gas of wood, which it contains, has been allowed to burn for some time in the open air, till the flame and smoke have passed away. Wood, previously charred, is also used for this purpose. The fire is comparatively left open in the apartment, as was clearly the case in the present instance; but in Western Asia, when the inmates wish to sit comfortably warm in their rooms, they often cover the brazier with a low table, over which is laid a carpet or thickly padded counterpane, of such ample dimensions that the parts which overlay the table can be drawn over the person, as they sit or recline upon their sofas, or cushions, which are arranged properly around the centre of warmth. They usually sit covered to the waist by the counterpane, which they themselves draw up to

their shoulders, and they present an appearance, which would suggest the idea of a family sitting up in a large bed, with their feet turned towards a common centre. The quilt, with the surrounding cushions, of course, detaining much warmth around the persons; but the plan appears unwholesome, and could only exist among an indolent people, who have no in-door occupation.

Certainly our American families would consider this a very undesirable domestic comfort, and all arising from the want of that simple, but very useful conveyance of smoke, the chimney.

In luxurious Rome, GIBBON says, "the form of the Atrium, the Basilica, the Cyzicene, Corinthian and Egyptian halls, bed-rooms, &c., were all various in form, and their proportions correct; but they were all attended with two imperfections, very repugnant to our modern notions of taste and convenience, for the rooms had neither side-windows nor chimneys. They were lighted from the top, and received the heat by the help of pipes that were conveyed along the walls."

Herculaneum had not a semblance of a chimney. Diocletian's Palace at Dalmatia, which was erected about a century after that of Nero, was warmed by hot air passing through pipes, but no chimney conveyed the smoke from the furnace. How should we, then, of the present day, venerate this clumsy appendage to our homestead comfort, and why should its appearance be so ungainly?—a protuberance at best—a swollen *welt* of brickwork inflicted on our domicile as a set-off for the benefit it confers. Architects should study its case, and reduce the unsightly inflammation as much as possible. Above the roof, the chimney shaft has had attention enough—too much at times—for the celebrated Sir John Vanbrugh has left England a heavy legacy of chimney architecture, in which he clearly illustrates the wise saying, that "too much is as bad as too little."

PLASTIC SLATE FOR ROOFING.

THIS fire and weather-proof material is so interesting, that we cannot refrain from penning a few paragraphs upon it, for the information of our readers.

It is the result of the comminution and re-formation of slate, the only other material required, for the re-aggregation of the mass of almost impalpable slate flour, or meal, being coal gas tar. Immediately associated in situ as part of the general group of stratified rocks—and perhaps originally combined—when brought into intimate mechanical contact, the first as a fine powder, and the last in its semi-fluid condition, slate and coal tar—the latter representing the natural bitumen—form a union which once effected, is absolutely indissoluble. And the artificial compound, from its very slowly diminishing plasticity, and quickly drying quality, is specially adapted to roofing.

In forming a roof of this kind, the wooden sheathing must be of the same general nature, as that prepared for the gravel roof; but the compound, being both very flexible and very tenacious, does not require the same extreme care and exactness.

It is not necessary to match, or tongue and groove, the sheathing-boards, but the more solid, level, and close they are laid, the better and more durable the roof.

A course of patent water-proof, double slate-felt, is laid across the boards, the edges lapping two inches. Each edge is fastened down by cleats, securely nailed, which are also covered with a four-inch strip of the same kind of felt, pasted down with plastic slate. The cleats may be elevated, so as to make a ribbed roof, or be flat, so as to present a smooth, unbroken surface.

This lining is designed to insulate the mastic from the boards, lest their shrinking and swelling should injure the final covering.

After the process of felting or lining the roof is completed, the plastic slate, mixed to the consistency of a thick mortar, which is more than two-thirds slate, is then spread upon the felt, with a trowel, to the thickness of a scant eighth of an inch. This makes a complete, flexible slate roof, if the work is properly done.

The Ingredients are—First: A fine-grained, hard, solid *Clay-slate*. No other kind of stone will make the article desired. It must be kept free from dirt, bits of wood, leaves, straw, and, in fact, any substance not in affinity with coal-tar; or it is useless to expect a fine and perfect mastic. It must be ground as fine as wheat flour, and sifted through a fine sieve, or bolted, to remove such particles as may pass between the stones unpulverized.

Second: Coal-gas Tar. This is a mixture of various substances, more or less volatile, which can be separated by heat, or distillation, from a residuum commonly known as coal-tar, gas-tar, and sometimes, coal-tar pitch. Coal-tar, proper, is a thick and viscid semi-fluid.

The powdered slate should be thoroughly mixed with the tar, to about the consistency of plasterers' mortar; and, after being mixed, should stand at least twenty-four hours before being used.

Within any moderate period, the longer the materials have been mixed, the better will be the roof.

In cold weather, the coal-tar must be heated, *but not to the boiling point*, while mixing in the slate; and the mastic itself must be warmed, but not made very hot, while spreading.

A close observance of these directions will insure success.

The covering material is peculiarly lasting; and, if the roof leaks, it will be owing to other causes than decay, or

deterioration, in the material wherewith it is covered. The water may pass around; and so, finally, underneath; but will not soak through it. Therefore, if persons using, design it to be a fire and weather-proof coating for the roof, or any other part of the building, they must be sure it actually covers what they wish to protect.

Plastic Slate can be applied, with the same good effect, to a roof of any angle, or to the perpendicular sides of a house. For the latter very important purpose it is put on with a brush as a paint, until it reaches the thickness of about $\frac{3}{8}$ of an inch. Its color is dark brown; although, of course, any color can be painted over it when set.

Its weight is about one-fourth that of tin.

It is smooth, and sheds snow easily.

Plastic Slate is perfectly fire-proof. Slate itself is strictly non-combustible; but the Coal-tar is combustible. If a fire is kindled upon a new roof, the oil will ignite and burn out; the slate, in the unctuous semi-fluid, is consolidated and petrified, and then remains intact. Nothing can be ignited through the slate, unless the latter grows red-hot. The oil being already volatilized by the heat, there is nothing left to burn; therefore, an old roof is fire-proof. But the new mastic will not burn, nor the oil burn out of it, unless in close contact with other combustible matter, which is already fired and giving off intense heat, so that if a wood or coal fire is kindled upon any part of a new roof, it will neither spread, nor burn the boards beneath.

It is a great renovator for old shingle or metal roofs.

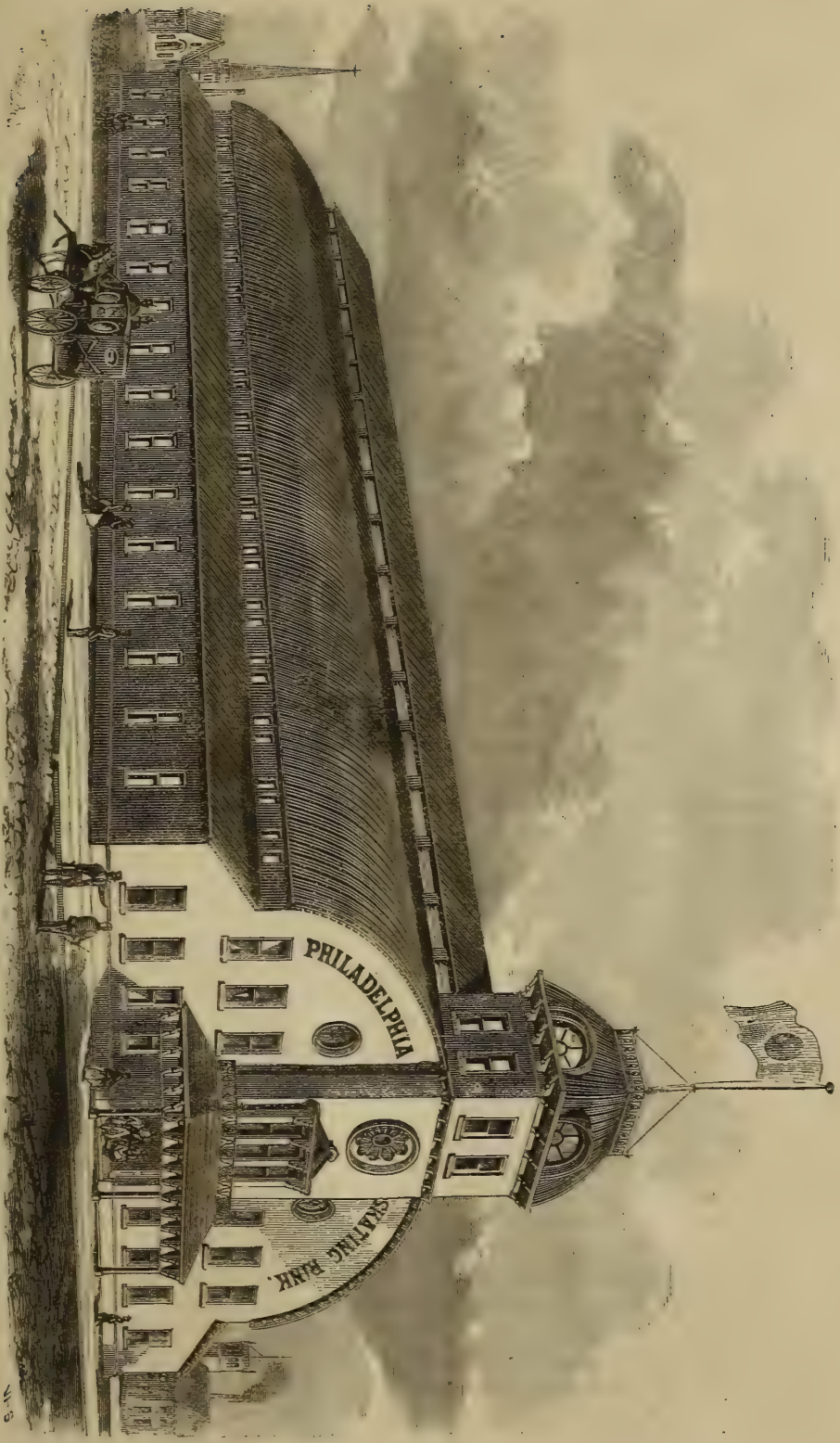
Plastic Slate is the invention of William L. Potter, a plain farmer and miller, of Clifton Park, New York. "After suffering many partial failures, in compounds of lime in all its various forms, in sand, granite, plaster, mineral coal clay of various kinds, red and blue shale, marble dust, soap-stone, cement, coal-

tar, vegetable tar, asphaltum, &c., in all the proportions and combinations that an intelligent and inventive mind could suggest, for fourteen years, he tried slate also, in many combinations, and found that the mixture of ground slate and coal-tar alone possessed the properties, and gave the results he desired." Not caring to have the reputation of introducing any thing of no intrinsic value to mankind, Mr. Potter devoted much time to testing his theory and final product by severe, private, practical experiments upon his own premises. Convinced finally of the great value of his discovery, he applied for letters patent, which were granted by the United States, in February, 1865, and by Great Britain soon after.

Plastic Slate was first brought into public notice, at a meeting of the Farmers' Club of the American Institute of New York, held June 20th, 1865, reported in the New York Tribune of July 1st, same year. The matter was called up by Mr. Solon Robinson, and discussed by Professor Tillman and Mr. James M. Allen, of Fredericktown, Ohio. The latter exhibited laths and shingles, mementoes of Mr. Potter's first experiments, which had the mastic firmly adhering; and almost incorporated with the very fibre of the wood. About the thickness of pasteboard, on the outside, had become indurated to the original hardness of slate. The interior retained a degree of toughness, imparted by the coal tar. At this rate, it would require about ten years, to harden a coating an eighth of an inch thick.

Whether mixed thin, and spread upon the sides of a house, with a brush, or mixed thick, and spread over the roof, with a trowel, this composition is immediately adhesive and impervious. Surfaces exposed for hours, in a coal fire, show no change.

For this information, we are indebted to the Philadelphia Agents, Messrs. J. S. CHAHOON & Co., of No. 102 South Fourth street.



PHILADELPHIA SKATING RINK, AT TWENTY-FIRST AND RACE STREETS:

COVERED BY OUTCALT'S PATENT ELASTIC JOINT IRON ROOF; WM. S. IRWIN, AGENT, NO. 406 LIBRARY STREET, PHILA. (See Page 637.)

OUTCALT'S PATENT ELASTIC-JOINT IRON ROOF.

WE present, in this number, a view of the new SKATING RINK, at the S. E. corner of Twenty-first and Race streets, in this city, which extensive structure is covered with the material called OUTCALT'S PATENT ELASTIC JOINT IRON, of which Mr. WILLIAM S. IRWIN, the agent, No. 406 Library street, and Reed street, below Tenth, Philadelphia, has kindly given us all desirable information as to its employment and application. The extensive use made by Civil Engineers, as well as Architects, of metal roofing for depots, markets, and all buildings requiring extensive coverings, gives this new invention a pre-eminent claim on the notice of all concerned in building, not alone for such extensive public structures as the great Skating Rink here illustrated, as well as all other places of vast capacity, but likewise as an admirable material for the roofing of all dwellings, as well as public buildings, civil and ecclesiastic.

The serious defect in metal roofs, hitherto, was the tendency to leakage, owing to the effects of contraction and expansion. This the present invention completely overcomes, as may be at once seen on reference to the accompanying cuts:

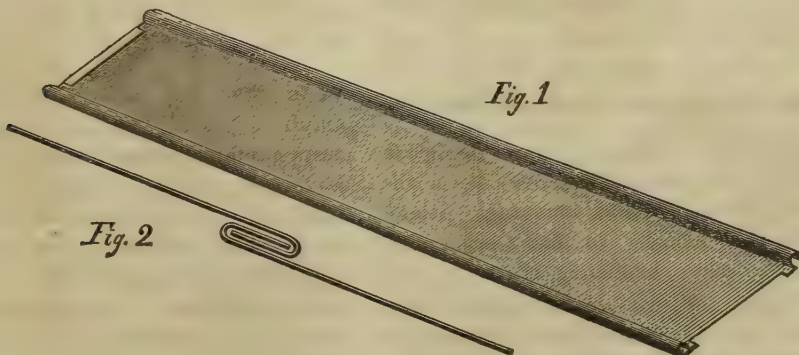
Fig. 1 represents a single sheet of the

metal, ready for application. It is shaped, for the purpose; by scrolling cylindrical tubes on the two outer longitudinal edges of the sheet, of which the one tube is formed by an upward, and the other by an inverted, roll of the edge. All the sheets being alike, the upward edge-roll of any one sheet fits, somewhat loosely, in underneath the inverted edge-roll of any other sheet; and, by thus hooking one edge-roll inside another, all is rendered complete, when considered from gable to gable. If taken from eaves to ridge, the end connection of the sheets is obtained by inter-fitting flat, erect and inverted hooks, formed at the respective tops and bottoms of the sheets; and represented, in section, at Fig. 2.

Fig. 3 shows a transverse section of the sheets, and the manner in which

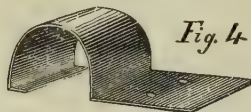


their edge-rolls are locked together. The scroll, or partly open tube, on each edge, is about three-fourths of an inch in diameter; and it will at once be observed, that it is perfectly water-proof.



It is likewise evident, that, if any dampness should exist beneath the roof, it will escape at this point.

Fig. 4 represents the cleat used for fastening the sheets in place. It is



formed of the same size as the inside scroll, (Fig. 3.)

Four or five of these cleats are locked in the inner scroll, and nailed to the sheathing, or the rafter, (if laid without sheathing,) as is frequently the case. The next sheet is hooked on, covering the fastening cleats of the preceding one, and protecting them from the weather! From this circumstance, it will be seen, that no nail holes are made in any part of the roof.

The ends of the sheets break joints, for the sake of convenience, appearance, and security; and, if the roof runs up to a ridge, the ridge itself is formed by an angular gutter of the sheet metal, inverted, and hooked over in the ends of the sheets, as above described, so that no moisture, rain or snow can penetrate the roof.

The sheets are made of sheet-iron, of ordinary thickness, weighing one pound to the square foot; and they are immersed in a brown, fire-and-water-proof paint, which thus enters into, and closes, the pores of the iron; and effectually protects both sides. Sheets of iron thus coated are impervious to the action of sulphuric acid, either diluted or concentrated.

In addition to the edge-rolls, or hooks, affording a thorough preventive of lesions, arising from expansion and contraction, they are very effectual against the force of winds. When the tornado of 1860 devastated Cincinnati, Ohio, but one, out of many of these roofs in that city, was damaged, and that slightly; while very many tin and other metal roofs were utterly destroyed.

While this patent is equally adapted to flat or steep roofs, one inch to the foot is all the slope required.

It can be applied as a temporary roof, and afterwards be readily removed, and laid upon other premises, either permanently or temporarily, without loss or injury.

We have spoken of the superior claims of this covering where none but a light roof can be admitted; and it follows, that this *lightness* is no disadvantage in the roof of a solid pipe.

STAINED GLASS.

FROM THE OLD AUTHORITIES.

No. 1.

THE HISTORY AND GENERAL METHOD.

WHATEVER is now doing in STAINED GLASS, rests upon the well-ascertained and immutable principles of chemistry, so that a success, in transparency, brilliancy, purity of tone, or beauty of color, can be repeated, to any extent, an indefinite number of times. But the earlier artists in glass,

while often very successful, were only empirically so. They fused together a certain number of substances, at a guess; and, if the process resulted in a hit, they followed the known proportions of the ingredients, whenever that particular color was needed thereafter, observing, also, all the steps of the process, as first taken; when, presumptively, many of the ingredients employed added nothing

to the effect, and many of the successive points of the process, were, if not absolutely wrong, at least only calculated to delay the intended result. Yet a detail of their operations, from a rare authority, may interest, or amuse, as an episode of history; and, although rather unlikely, the processes given, *may* afford a hint to some experimenting chemist, or painter of stained glass. With this view, we extract the matter presented below:

STAINED GLASS.

Felibien, in his "*Principes de l'Architecture*," third edition, 4to, Paris, 1699, inserts, page 180, a chapter on GLASS, in which he says, that at first transparent stones, such as agate, alabaster, and others, were used in buildings, to admit the light, and keep out the cold and the wind. Glass having been afterwards invented, that material was substituted in the place of the former, and these glass windows were made in the following manner:

In the foundries glass was made of different colors. The ancient artists, therefore, took such pieces to put in the windows, arranging them in compartments like mosaic; and this was, afterwards, the origin of painting upon glass; for, observing what a beautiful effect was thus produced, they were not, in after times, contented with this assemblage of pieces of various colors, but were desirous of representing all sorts of figures and entire histories.

At first this painting was done upon white glass; and the colors were tempered with size as is the case in painting in distemper. But, because it was soon found, that these could not long resist the injury of the air, the artists sought for other colors, which, after having been laid upon the white glass, and even on that which had been already colored in the glass-houses, might sink into, and incorporate themselves with, the glass itself, upon its being put into the fire. In this they completely suc-

ceeded, as is evident from the beauty of the ancient glass.

When the workmen were desirous of making windows of extraordinary beauty, they employed the glass, which had been already colored in the glass-houses to make the draperies of the figures, and they only marked the shadows in it, with some touches and hatchings in black. For the carnations or flesh-tints they chose glass the color of which was a transparent red, on which they drew, with black, the principal features of the face and the markings of the other parts of the body.

But, to make the carnations and draperies on white glass, they laid their colors, transparent or opaque, without demi-tints, either strong or weak, as the painting demanded. Thus, these earlier works, made before the sixteenth century—such as we yet see, in the more ancient European churches—are of a Gothic manner, and extremely barbarous, as far as regards the drawing, and the preparation of the colors.

When, in France and Flanders, painting began to improve, this gross manner was changed; and the honor of the finest works, done upon glass, is due to the French and the Flemings.

A painter of Marseilles communicated the first knowledge of this species of painting to the Italians, when he went to Rome, in the pontificate of Julius II. After him, Albert Durer and Lucas of Leyden improved the art still further; and a number of works so excellent have been produced, that nothing more exquisite can be desired, either for beauty of design, or management of color.

As instances of excellence in glass prepared from the designs of great masters, the Church of St. Gervaise, at Paris, after John Cousin; the Chapel of Bois de Vincennes, of which Lucas Peni, an Italian, made the cartoons; the Castle of Anet; the Castle of Gaillon; and the Church of St. Owen, at Rouen, and in other places.

Felibien, p. 182, proceeds to direct

the mode of PAINTING UPON GLASS, in the following manner :

Before any one begins to paint upon Glass, the whole subject is to be drawn and colored upon paper. Then such pieces of glass are chosen, as are fit for painting the figures in portions, so that the pieces may join in the outlines of the body, and the folds of the draperies, in order that the lead, which is used to hold them together, may not spoil the carnations, nor the most beautiful parts of the draperies.

When all the pieces are cut, according to the design, and agreeably to the size of the work, they are to be marked with numbers or letters, to know them again. Then every piece is to be painted with color, in accordance with the design, which the painter has before him. Sometimes the painting is done *only in white and black*; and then both the style and the glass embodying it are called GRISAILLE.

In the ancient glass, some very beautiful and extremely lively colors are seen, which are not to be found now. It is not, that the invention is lost, but because persons will not risk so great an expense, or take the necessary pains to make them, since, in fact, labor is not dearer in this department than heretofore.

These fine pieces of glass, as made in the glass-houses, were of two sorts. Some were entirely colored, that is to say, where the color was spread through all the mass of glass; but others, which the workmen used commonly and more willingly, had the color only on one side, into which it penetrated, more or less, according to the nature of the colors, for yellow enters deeper than the others. Although these last did not contain colors so lively and bright as the former, they were more convenient for the glaziers, because upon the same piece of glass, although already colored, they were accustomed to employ other colors, when they wanted to ornament the draperies, to enrich them with

flowers, or to represent other decorations of gold and silver. For this purpose they used emery, with which they rubbed the piece of glass on the side which was already charged with color, till they discovered the white glass—according to the work they designed to produce—after which, they covered with yellow, or such other color as they pleased, the opposite side of the glass; that is to say, where it had remained white from the beginning, and where they had not scratched it with emery. This method they observed, to prevent the new colors from mixing with the others, when the pieces of glass were put into the fire.

Painting on glass is performed with the point of a hair pencil, especially for the carnations; and the colors are laid on, tempered with water and gum, in the same manner as is done in miniature.

When any one paints on white glass, and wishes to give smart touches, to mark the hairs of the beard, the hair of the head, and other strong lights, whether it be on the draperies, or elsewhere, he makes use of a little point of wood, the end of the handle of the pencil, or a pen, to take away, from the back of the glass, the color, which had been put in the places, where he means that none should appear.

So far Felibien, whom we shall take up again, for a second and a third article, upon this general subject. To such of our readers as live remote from the larger cities, we may be allowed to say that, while the above very faithfully represents the mediæval method, the moderns are able to make as free pictures upon glass as upon canvas, but for church effects, often follow the style of the days of yore. Upon the modern method we shall probably give in the early future a number of original articles, by one of the present adepts, which those who have read the papers by Mr. John Gibson, in former numbers, will be eager to peruse.

COMFORT CONSIDERED IN BUILDING.

IN Domestic Architecture, there is nothing which calls forth the skill of a designer more, than that necessary adaptiveness, of every part of his plan, to the wants of the family to be accommodated; and, in this, we include all those little details of convenience, which go to make up a really comfortable house. A judicious distribution of rooms, with easy access to each, is the essential required in a plan. There is, also, a peremptory necessity for an arrangement, by which the Kitchen, Dining-room, and Pantries, shall be within easy reach; for there is nothing more repugnant to domestic comfort, than a mal-arrangement of these features of a plan. As to bed-chambers, the first object should be ventilation, and the next an appropriate space for the bedstead, matters too often neglected. Many times have we seen chambers, where the bedstead was, of necessity, placed across, or half across, a window. This is an unpardonable fault, in a design; and should be carefully avoided. Dressing-rooms are requisites of the first importance; and wardrobes should be provided, of sufficient size, and judiciously located.

The staircase, being the great means of access, is of course a matter of the first consideration, as to capacity and convenience. It must be wide enough; and should be so placed, as to connect the respective floors, in such a manner, as to give as little trouble as possible, in reaching all the rooms it leads to. In fact, to unite the requisites, which a good staircase requires, namely: convenience in situation and form, with a sufficiency of light, affords one of the strongest proofs of an Architect's skill.

In large houses, where the breadth will admit of the hall being in the centre, the stairs can be easily managed, by *double returns*, to give easy access to any side. Nothing presents a finer ap-

pearance, on entering a hall, than an elegant, easy stair of two returns, capacious and well lighted. Here the Architect has ample opportunity for a display of skill, in the sweep or curve of the flight. And, in this development of effect, he should manage to have a hall of commensurate size; if possible, open to the roof, and having elegant galleries on each floor: the whole lighted from a dome of stained glass. In this hall, there should be locations for statuary, &c.

The times of the Tudor line of monarchs were remarkable for halls; but they were then more than mere stair-chambers. The family dined in them; and public feasts were held there.

Early in the Sixteenth century, however, the change of manners gradually led to the withdrawal of the family from the hall; and to the introduction of the dining-room, further from the entrance of the house. In the Aubrey MSS., a rich old legacy to modern English antiquaries, the following quaint account is given of the ancient hall, and the mode of their serving at meals:

"The lords of manors did eate, in their great Gothic hall, at the higher table or oreile; the folks at the side table; the meat was served up, by watchword; Jacks being but an invention of the other daye, the poor boys did turne the spit, and lick the dripping-pan, and grew to be great lusty knaves. The body of the servants were in the great hall, as now in the guard-chamber, privy chamber, &c. The hearth was commonly in the midst, as at colleges, whence the saying, 'Round about our fire.' Here, in the halls, were the Mummings, Cobloaf-stealing, and great number of old Christmas plays performed. In great houses were Lords of Misrule, during the twelve dayes after Christmas. The halls of justices of the peace were dreadful to behold; the screens were garnished

with corslets and helmets, gaping with open mouth, with coats of mail, lances, pikes, halberts, brown-bills, battle-axes, petronells and culverings; and, in King Charles's time, muskets and pistols."

But those feudal times, which called for halls like these, have passed away in Europe; and in our country have never had a place, nor ever will: so that we can just smile at the past; and draw comfort from the future.

The desire of every one amongst us, who builds a house for his family, is to secure as much of display as he can afford to pay for; but, above all other considerations, that of comfort is his object. To produce this desired effect, then, it becomes the duty of the architect to seize every opportunity of combining the two, and thus making his design at once satisfactory to the owner and the observer.

STATUARY AS AN AID TO ARCHITECTURE.

SCULPTURE of the human figure does not appear to command that attention amongst our American architects, which its position in the Fine Arts so naturally calls for. Yet no one can deny its power of attracting attention. Why, then, is it not used, more generally, by the profession; seeing that their end, aim, and object, is to draw observation to their work? Moreover, Sculpture is, in itself, so suggestive, so life-giving, as it were, that architecture has a Promethean auxiliary in it, of no common power.

In the proportioning of statues to the elevation, at which they stand, consists the great beauty they confer on the general design. And, perhaps, the secret, of the human form divine being denied a place on almost all of our American fronts, lies in the danger of wrong proportions, for the figure, having a bad effect on the whole. But, if justly proportioned how complete will be the effect of the human figure upon the design.

Our architects seem afraid to venture on the introduction of this embellishment. But why? Possibly they may think, that their clients will become restive, as considering themselves saddled with an unnecessary expense. We think not. Our wealthy citizen, who desires to build in elegant taste, is very far from being illiberal; and, as well as he accepts his architect's ideas on one sub-

ject, so will he be perfectly willing to receive them on all others, that go towards rendering the structure he takes pride in one to redound to his credit.

We particularly refer to sculptured figures on exteriors of buildings, as practised in Palladian architecture.

As there is no fairer model of correct proportion, than a perfect human figure, so there is no more appropriate embellishment for a design, whose aim is, to produce that same delightful feeling, in the observer. If the appearance of sculpture is pleasing to the eye, and the embodiment of a design be likewise satisfactory, how complete must the combination be, of those beautiful sisters of the Fine Arts.

We desire to see our sculptors increase and multiply; and our architects to lend a generous aid to this effect. The one art will, with a kindred spirit, aid the other; and both draw forth the national taste. Our country is rich in artistic talent; and the marble, so fitting for our climate's requisitions, is by us, in abundance. Where, then, is the obstacle? There is none! Let our professional brethren prove their love for sculpture, by introducing Statuary freely, but ever judiciously, on their elevations; and generations of POWERS, CRAWFORDS, and HOSMERS, will stamp their names, in the future, to the honor of Architecture and America.

ROOFING.

HAVING already discussed slate as a material for roofing, we now briefly advert to other of the more immediately useful and practical substances, or applications of substance, for that purpose. And, first:—

GRAVEL ROOFING.

For this kind of roof, if a good job is desired, it is a matter of prime necessity, to have the wooden sheathing, which forms the basis of the roof, well secured to the rafters, and laid perfectly smooth. The slant must also be true and uniform; and all the knot holes must be carefully plugged up and smoothed over, as all such apertures are apt to cause breaks beneath the feet of any one passing over the roof, and consequently leaks. The felt, which really forms the preventive against leaking, and is actually a kind of woollen paper, is now loosely laid upon the boards of the roof, to the extent of three thicknesses, breaking joints with each other, and is properly secured by cleats. This done, the felt is completely covered with coal gas tar, of a consistency that will not run in warm weather. This consistency can only be determined by the experience of a practical and practised roofer, in these materials. The tar is very evenly spread or smeared over the felt, by means of a cotton mop. The mopping, also, is a part of the general operation, which can only be adequately performed by an experienced workman. We are informed by MESSRS. WARREN, KIRK, & Co., Farquhar Buildings, No. 228 Walnut street, who have very obligingly afforded us all the information in their power—whose experience in the matter is not slight, they having used 6,000 tons of gravel upon

2,000,000 square feet of roof last year—that out of a hundred men in their employment, only fifteen are competent to mop a roof. The quantity of tar also must rest upon the experienced discretion of the mopper. Too much will run, to the great disfigurement of the house front, and the intense disgust of the passers by.

While the above is going on, the laborers are heating small pebbles, in a large cylindrical iron pot, by means of a wood fire in the open street, before the premises, and these are hauled up in a little keg, with a rope and simple pulley, attached to a light temporary derrick, and equally spread over the soft tar. The heating is to the end, that the gravel stones may sink in, and more firmly attach themselves to the surface of the tar. The superfluous pebbles, or gravel stones, are now lightly raked off, and saved for another occasion, and, all the drains, gutters, &c., having been previously arranged in the wood-work and the felting, the roof is now complete.

The object of using the pebbles, is to protect from the weather, the surface of the tar, and this, in turn, protects the surface of that more important covering, the felt.

The best pebbling is ocean gravel. That used in the vicinity of Philadelphia, by the firm lately mentioned, being from Horton's Point, Long Island, New York.

These roofs are made of many different inclinations to the horizon; but should, of course, be rather flat than steep. From one-half to three-quarters of an inch to the foot is absolutely necessary; and a roof of six inches to the foot is, by the roofers, warranted to be of the very best.

NOTE.—Want of space has compelled the omission of a portion of this article, comprising another kind of Roofing: to follow in our next.

QUERIES AND RESPONSES.

Under this head, we propose to present to our readers a page for the benefit of all, who desire information on any subject within the range of Architecture and Building. This department will be one of extreme importance to many, and especially to those inquiring minds, who are studying first principles. But, indeed, to all, whether old or young, it cannot but prove acceptable; for, where is that man, that cannot add to his store of knowledge by gleaning from the fields of his neighbor? We will spare no labor or pains, at all times, to give our

correspondents the most reliable answers; and, when it may happen that we cannot do so from ourselves, we will present the matter to our readers, with the invitation to any one to lend a hint in elucidation of the question. Here then is a chance for all; and let us hope it will create a desire for mutual benefit; and aid in the advancement of that knowledge, which we all seek to develop.

To our correspondents let us say: Be brief, and to the point; for, our time and space are alike valuable. Be legible; for the printer's patience must not be tried.

PUBLICATIONS RECEIVED.

THE VON TODDLEBURGS; OR, THE HISTORY OF A VERY DISTINGUISHED FAMILY. By F. Colburn Adams. Here is a very amusing book, indeed, illustrated in a style well worthy of the text. Such histories as this are healthy literature, inasmuch as they distinctly mark out the ridiculous points in every-day people; and enable the reader who desires to avoid the rocks that some split on in their voyage through life, to be warned and govern themselves accordingly. It would be an unnecessary task to give any of the very spicy scenes in which this book abounds; as we well know it will be sure to make its way into every reader's hand who loves a treat of quiet fun. It is well printed, on good paper, and neatly bound.

GOLDEN LINKS, OR, THOUGHTS FOR THE HOURS This is a pretty gem for the adornment of the youthful or even the thoughtful mind so furnished is it with exquisite extracts from the master minds in prose and verse, and so imbued with noble Christian thoughts. The style of gilt-edged beauty with which it is gotten up makes it a worthy gift for a friend, or ornament on a boudoir table. The size is 12mo, making it likewise a nice pocket companion.

THE MULE. The late war taught our people to value and respect this reviled and much-abused animal. Strong, enduring, mild and docile, he has made his many merits known, and when the wants of labor call forth his powers he is ever ready to do his work and put up with coarser and less food than any beast of burthen. This useful little book is a treatise of 106 pages, fully illustrated, of the breeding, training, and uses to which he may be put. By Harvey Riley, Superintendent of the Government Corral, Washington, D. C.

TOLD IN THE TWILIGHT. Here are 108 pages of highly interesting short stories, for long evenings, by Sidney Daryl; most fittingly illustrated and forming a suitable gift for the rising generation.

BYRON'S POETICAL WORKS. The Globe Edition, complete in one volume. Who has not read Byron? Who would wish to forget him? Here is a book for the million, 608 pages, closely printed, containing all of the great poet's poems, at *Fifty Cents*. Oh, shade of Byron stand aside, and make way for the spirit of this Nineteenth Century! All the foregoing books are published by CLAXTON, REMSEN & HAFPELFINGER, of this city

THE MANUFACTURER AND BUILDER is the title of a very neatly got up quarto of 48 pages, of three columns each, well adapted to the necessities of mechanics in general. In fact, it might be very appropriately styled the *Mechanics' Magazine*, an aid to industrial art much wanted in this country. Its articles are well chosen, lucidly written, and the whole number is amply illustrated. We hail with pleasure its advent, as a reinforcement to the great march of intellect of this, our progressive day. It is published monthly, at 37 Park Row, New York, by WESTERN & Co.

THE GARDENERS' MONTHLY comes to us to receive our ready welcome, for its columns are always replete with information. What better accompaniment to a comfortable house in the suburbs or country, than a well cultivated garden; and who but feels thankful for every fresh item of instruction, such as the little publication before us gives monthly.

THE WORKSHOP continues on its course, dealing out well illustrated and highly intelligent lessons in mechanic skill. This publication is well worthy of the large and ever increasing patronage it receives, and we sincerely offer it our congratulations on its well-deserved success.

MORGAN'S BRITISH TRADE JOURNAL. London. This is one of those publications which add solid contributions to the wealth of information. A friend whose serial visits from the land beyond the sea, are always looked for with pleasure, and are ever satisfactory.

THE
ARCHITECTURAL REVIEW
AND
AMERICAN
BUILDERS' JOURNAL.

VOL. I.—Entered according to Act of Congress, in the year 1868, by Samuel Sloan, in the Clerk's Office of the District Court of the United States, in and for the Eastern District of Pennsylvania.

MONTHLY REVIEW.

THE MINSTERS OF FRANCE.

THE desire, which early Christendom glowed with, to pay the highest human honors to Religion, gave energy to those efforts, which reared up the mighty temple to the Most High. And thus we have seen wonders, worked out in stone and wood, at Milan, Cologne, Strasburg, Antwerp, Canterbury and York. We now visit, and pass in review, the great metropolitan church of Paris,

NOTRE DAME CATHEDRAL.

There is no positive record of the primitive history of this sacred edifice. But it is known, that the site was occupied by a church, dedicated to St. Stephen, the first martyr, which stood over a pagan altar, erected in the reign of Tiberius, in honor of Jupiter, the remains of which were discovered, in 1711, beneath the choir of the present Cathedral of Notre Dame.

The Church of St. Stephen, here spoken of, was erected about A.D. 365, in the time of Valentinian I. This was rebuilt, in 552, by advice of St. Germain. The Church, or Chapel, called *Notre Dame*, which now gives name to the whole Cathedral, was dedicated, by Childebert, to the Virgin, under that title. There is a difference of authorities, as to the exact time of the founda-

tion of the complete Cathedral. Probably the first stone was laid by Pope Alexander III., who had taken refuge in France, while Maurice de Saliac was Bishop of the diocese. This was in 1127; and in 1177 the bishop had the apsis of the choir built, but not quite roofed in. The high altar was consecrated in 1182, by the Pope's legate; and in 1185 Heraclius, Patriarch of Jerusalem, who came to Paris to preach the third Crusade, officiated in Notre Dame for the first time.

The west front was finished A. D. 1223, in the reign of Philip Augustus. The Southern Transept with the grand portal in 1257, during the reign of Saint Louis. The architect was JEHAN DE CHELLES.

The Northern Transept and portal, as also the canopies surmounting the side windows, were erected in 1312, by Philip le Bel, with the effects of the confiscated estates of the Knights Templars.

The *Porte Rouge*, or Red Gate, was erected in 1407, by the Duke of Burgundy, the assassin of the Duke of Orleans, to expiate his crime. On this account, it was formerly painted red; and hence the name. The interior of the Choir was begun in 1799, and

finished in 1714. In 1748 the floor of the Cathedral was so far above the level of the street, that thirteen steps led up to it. In that year the street level was raised to its present grade.

The plan of this Cathedral is cruciform, with an octagonal eastern end. At the western end are two lofty square towers, which were intended to support spires. The dimensions of the whole are as follows: Length 390 feet, width at transepts 144 feet, height of vaulting 102 feet, height of western towers 204 feet, width of western front 128 feet. The length of the nave is 225 feet, width 39 feet. The roof is 356 feet in length, formed of chestnut timber, and rising 30 feet above the vaulting. The weight of the lead, which covers it, has been calculated at 420,240 pounds!

The diameters of the circular windows are 36 feet.

The foundations are laid 18 feet below the soil, on a hard stratum of gravel.

It is difficult, at this day, to look into the interior of this sublime old Minster; and form any idea, from its present appearance, of what it once was. In the words of Victor Hugo: "If we enter the edifice—Who overthrew the colossal statue of St. Christopher?—proverbial amongst the statues, as the large hall of the Palace is amongst halls, as the spire of Strasburg amongst spires. And the myriad of statues that once occupied the intercolumniations of the nave and the choir?—kneeling, on foot, on horseback, men, women, children, kings, bishops, men-at-arms in stone, in marble, in gold, in silver, in copper, even in wax. Who has brutally swept them away? It is not Time.

"And who substituted for the old Gothic altar, splendidly encumbered with shrines and relics, that heavy sarcophagus of marble, with angels' heads and clouds, which seems to have strayed from Val de Grâce, or the Invalids? Who stupidly sealed this heavy stone anachronism in the Carolingian pavement of Hercandus?"

Again viewing the exterior, we find much to admire, as well as much critically to condemn. The general style is Gothic, of a very mixed order. Those parts built in the fourteenth century being closely copied from what previously existed, and distinguishable only by a higher degree of finish in the ornaments.

The *Western Front* is decidedly the most prominent, as well as the finest feature of the whole. Three ample portals lead into the nave and aisles. They each form a series of retiring arches, with angels, saints, &c., in the intermediate mouldings. The portals are bisected by square pillars, the tympanums above them being richly sculptured. The portals of the transepts have similar finish; the central one of the western front was spoiled by Soufflot, A. D. 1760, who formed it into a pointed arch; but it has since been restored to its original form, according to the original designs, which were preserved.

In the northern tower is the celebrated bell called the *BOURDON*, which is never rung but on occasions of grand solemnities. It weighs nearly sixteen tons, and its clapper about half a ton. It was cast in 1683, and re-cast in 1685. Louis XIV. and Maria Thérèse acted as its god-father and god-mother, and it received the name of Emmanuel-Louise-Thérèse.

On the front façade, forming a deep belt above the three principal entrances, are twenty-eight royal niches, each of which is the shelter for a French monarch (in stone) from Childebert to Philip Augustus, who held in his hand the imperial globe. The flight of steps, which formerly elevated this magnificent structure so much, as to add materially to its effect, owing to the constant raising of the grade of the street, as before alluded to, has been taken away, in great part, leaving but three steps as ascent.

In the section above this tier of royal niches are three windows, two of these in *ogive*, with circular lights in the

tympanum. The centre of this section is occupied by a rose-window of beautiful detail. Each lateral front of the church presents a similar window—delicately executed. The rose of the southern side was given by Cardinal de Noailles. It cost 80,000 livres. The upper part of the façade is decorated by a peristyle, composed of thirty-four columns, remarkable for their height and slenderness. They are each formed of a single stone, and support a gallery with balustrades.

The walls of the church are supported with buttresses, which are remarkably well arranged, and are surmounted by pyramids and little pinnacles of very picturesque effect. One of the most curious parts of the edifice is the carpentry of the roof, which is called the *Forest*, on account of the number of pieces of wood, of which it is composed. This wood is covered with 1,236 sheets of lead.

The interior of Notre Dame is in the form of a Latin cross. One hundred and twenty pillars, of different structures, support the vaulted ceiling, and form a double passage round the choir and the nave.

Twenty-seven chapels occupy the side aisles; and above them are spacious galleries and elegant tribunes. Most of the ornaments are of the modern style, and but little in harmony with the architecture of the edifice; but, taken separately, they are not the less precious. We will mention the bassi-relievi, in gilt bronze, of the high altar; a marble group, a *chef d'œuvre* of art, representing the Descent from the Cross, by Nicolas Coustou; the statue of the Holy Virgin, by Antonio Maggi; the mosaic pavement of the sanctuary; the sculptured wood-work; the pictures by Jouvenet, Philippe de Champagne, Louis Boullogne, Laurent La Hire and La fosse; the railings of polished iron, which enclose the choir; the bassi-relievi which decorate the interior, and which were executed in the fourteenth century;

and, lastly, several tombs, amongst them those of the Count D'Harcourt and the Cardinal de Belloy.

There formerly stood, near the first pillar of the nave, a colossal statue of St. Christopher. It was twenty-eight feet high, and was erected A. D. 1413 by Antoine des Essarts, chamberlain of Charles VI., in gratitude for that saint having appeared to him during the night, and broken open the doors of a prison, in which he was confined. This statue was destroyed in 1785. Another celebrated monument stood at the extremity of the nave, just at the entrance to the choir; it was an equestrian statue of Philip le Bel, as large as life. This Prince was represented as he appeared, when he arrived in Paris, after the battle of Mons-en-Puelle, when he went fully armed to Notre Dame, to render thanks to God for his victory. This statue—which was valuable as an historical souvenir, and interesting as a specimen of the costumes of the epoch—was hacked to pieces, in 1792, by the Mar-seillais, with their swords.

Behind the high altar is a group in marble called *The Vœu de Louis XIII.* He placed his kingdom under the protection of the Holy Virgin; and in 1638 made a vow to repair the high altar of Notre Dame. But he having died before the vow was accomplished, Louis XIV. determined to fulfil the vow in his father's name; and, in 1699, solemnly laid the first stone of the altar. However, the group was not executed, until twenty-four years after, by Coustou. It represents a large cross of white marble, over which is thrown a drapery; at the foot is the Virgin seated, holding in her arms the body of Jesus; by her side are placed on pedestals, figures of Louis XIII. and Louis XIV., presenting to her a crown, removed during the Revolution. The statues of the two kings were brought back in 1816.

As an historical monument, the Cathedral of Paris is very remarkable. The old kings of France used to visit it, after

their accession to the throne, to renew the oath to observe the laws faithfully, and to govern for the happiness of the people. It was there that they carried the trophies of their victories; and addressed their prayers to Heaven, when any great calamity afflicted the country. As the churches of England, in the times of confiscation and plunder, those of France suffered from outbreaks with a like devastating effect; and none more so than the beautiful Minster NOTRE DAME DE PARIS. Under the Convention, Notre Dame, despoiled of its works of art, mutilated in every portion, and especially in the façade, was transformed into the Temple of Reason. Under the Directory, the theo-philanthropists celebrated the worship of the Supreme Being in it; and, in 1801, a pretended Council, consisting of one hundred and twenty constitutional bishops, or priests, was held in it. On the 18th May, in the same year, a mass and a "*Te Deum*" were celebrated there, in the presence of the three Consuls, on the official re-establishment of Catholic worship. It was in the Cathedral of Notre Dame that Napoleon I. was crowned Emperor by Pope Pius VII., on the 2d December, 1804.

The middle door of the grand portal of the church was disfigured under Louis XIV.; but it has been restored. The great portal and the towers have also been repaired; in the south part of the Cathedral, the archbishop's vestry has likewise been repaired; its Gothic style of architecture is in perfect harmony with that of the metropolitan basilica.

"Notre Dame," says Victor Hugo, "is not what can be called a complete, defined, classic monument. It is not a Roman and still less a Gothic style; it is not a type. Notre Dame de Paris has not, like the Abbey of Tourmes, the grave and massive character, the round and large vault, the icy nudity, the majestic simplicity of edifices constructed on the system of semicircular arches.

It has not, like the Cathedral of Bourges, the magnificent, light, multiform, efflorescent character of the Gothic. It is impossible, also, to range it in the old class of dark, mysterious, low churches, which seem crushed by the Saxon arch, almost Egyptian, with the exception of the ceiling, more charged with ornaments of lozenges and zig-zags than flowers, with flowers than animals, with animals than men; a work of the architect less than one of the bishop; the first transformation of that school of art bearing the imprint of theocratic and military discipline, which begins in the Lower Empires and ends at William the Conqueror.

"It is, likewise," continues Victor Hugo, "impossible to place our Cathedral in that class of lofty, airy churches, rich in painted windows and sculptures, sharp in outline, bold in altitude; communal and burgess-like, as political symbols; free, capricious, extravagant as a work of art; a second transformation of architecture, no longer hieroglyphic, immutable and sacerdotal, but artistic, progressive and popular, which begins on the return from the Crusades, and ends at Louis XI.

"Notre Dame de Paris is not of the pure Roman style, like the first; nor of pure Arab style, like the second.

"It is an edifice of transition. The Saxon architect succeeded in planting the first pillars of the nave, when the pointed style came and planted itself, as a conqueror, on the large Roman capitals, which were intended for semicircular arches. The Gothic henceforth took precedence, and the rest of the church was built in that style. However, inexperienced and timid at the outset, it does not venture to display itself in spires and pinnacles, as it will do subsequently, in many marvellous cathedrals. One would say, that it suffers from the neighborhood of the heavy Roman pillars.

"These edifices of transition, from the Roman to the Gothic style, are not less

precious to study, than the purest types. They express a shade of art, which would be lost without them. They are the grafting of the pointed style on the Saxon arch.

"NOTRE DAME DE PARIS is, in particular, a curious specimen of this variety. Every face, every stone of the venerable monument, is not only a page of the history of the country, but also one of science and art."

Besides the great Bell called the *Bourdon*, there is another which was brought from Sevastopol.

The mechanism of the Clock is very curious, although not equal to that of Strasburg. It has in connection with it four bells of large size.

The Organ is remarkably fine; it is 45 feet high, 36 feet in breadth, and contains 3,484 pipes.

The high altar was pulled down at the Revolution of 1789; but, under the Empire, it was re-erected; and such of the works of art as could be collected were restored. The lateral chapels of Notre Dame were formerly remarkable for their splendor, the walls being covered with marble, or finely-carved wainscoting and containing sumptuous tombs, belonging to noble families. These were stripped of their riches in 1793; many of them, however, have been repaired; and, in fact, every part of the great Cathedral has, under the existing Empire, been thoroughly cared for.

The *Sacristy* consists of a spacious and lofty hall, with three windows, in the pointed style, decorated with the portraits of twenty-four archbishops of Paris, all beautifully executed, in stained glass, by M. Mareschal, of Lyons, from St. Landry, who lived in the time of Charlemagne, to Archbishop Affre, who fell in the insurrection of 1848. He is represented on his death-bed. The ribs of the ceiling spring from the canopies of niches, containing statues of saints and angels. Well-designed Ambries are sunk into the wall, and the furni-

ture of the room consists of oaken presses, containing the precious church utensils and vestments, for which this Cathedral is celebrated. Here will be seen croziers, mitres, and crosses, sparkling with precious stones; the robes worn by Pius VII., at the coronation of Napoleon I.; several series of most gorgeous robes, profusely embroidered in gold and silver; the mask of Archbishop Affre taken twenty-four hours after his death, the ball with which he was struck, and the two vertebrae that received it.

At the sacking of St. Germain l'Auxerrois and the Archbishop's palace in 1831, the populace broke into the Sacristy of Notre Dame, and, headed by officers of the National Guards, destroyed every thing that came within their reach. The deplorable damage occasioned by this barbarous onslaught was irreparable; the coronation robes of Napoleon, and the splendid dresses he presented to the bishops and the chapter on the occasion of that ceremony, memorials of it were torn up recklessly by the senseless mob, for the sake of the gold embroidery on them. They have, however, since been repaired. To show the madness that ruled this demoniac raid, a celebrated artist who was making a most elaborate perspective picture of the interior of Notre Dame, having left it on the easel in the vestry, it was cut into a thousand pieces! Such are some of the acts of violence enacted by ignorance and brutality led on by fanaticism. We have seen the like effects of ignorant fanaticism displayed in the sacrilegious dilapidations at York and Canterbury, England; and we may always look for them where such influence was excited.

We now take leave of this grand old historic monument; and hope that our readers, who have not had the pleasure of personally inspecting its points of attraction, will yet pay a visit to the brilliant French metropolis, and its Minster of NOTRE DAME DE PARIS.

DESCRIPTIONS.

THE NEW BANKING OFFICE OF "THE PHILADELPHIA SAVING FUND SOCIETY."

THIS edifice is an example of the fast developing tendency to build for the future as well as for the present, not only with respect to commodiousness and convenience, but also to durability. Institutions of this kind have, until recently, been content to occupy buildings of ordinary construction, but various causes have combined to induce some of them to provide better and more substantial facilities for business.

Foremost in Philadelphia, if not in the country, in taking care of the savings of the poor, stands "The Philadelphia Saving Fund Society." Founded in 1816, and managed by a succession of our best citizens, it has continued to grow in strength and usefulness, until the present building has been found insufficient for the accommodation of the business, which, attracted by the solid character and reputation of the Society, sought the way to its doors.

To enlarge its capabilities for doing good—the Managers receive no emolument whatever for their services—this Society, in the latter part of the year 1865, determined on the erection of a new and more commodious building than that which they now occupy. Having purchased a suitable location, at the southwest corner of Walnut street and West Washington Square, they proceeded to procure plans and estimates for their new structure.

Here we may pause to commend the sagacity and benevolence of this body of men in choosing a site, for it is not too much to say, that in the whole city another such could not be found. Convenient to the great business centre, with the large front on one of the finest

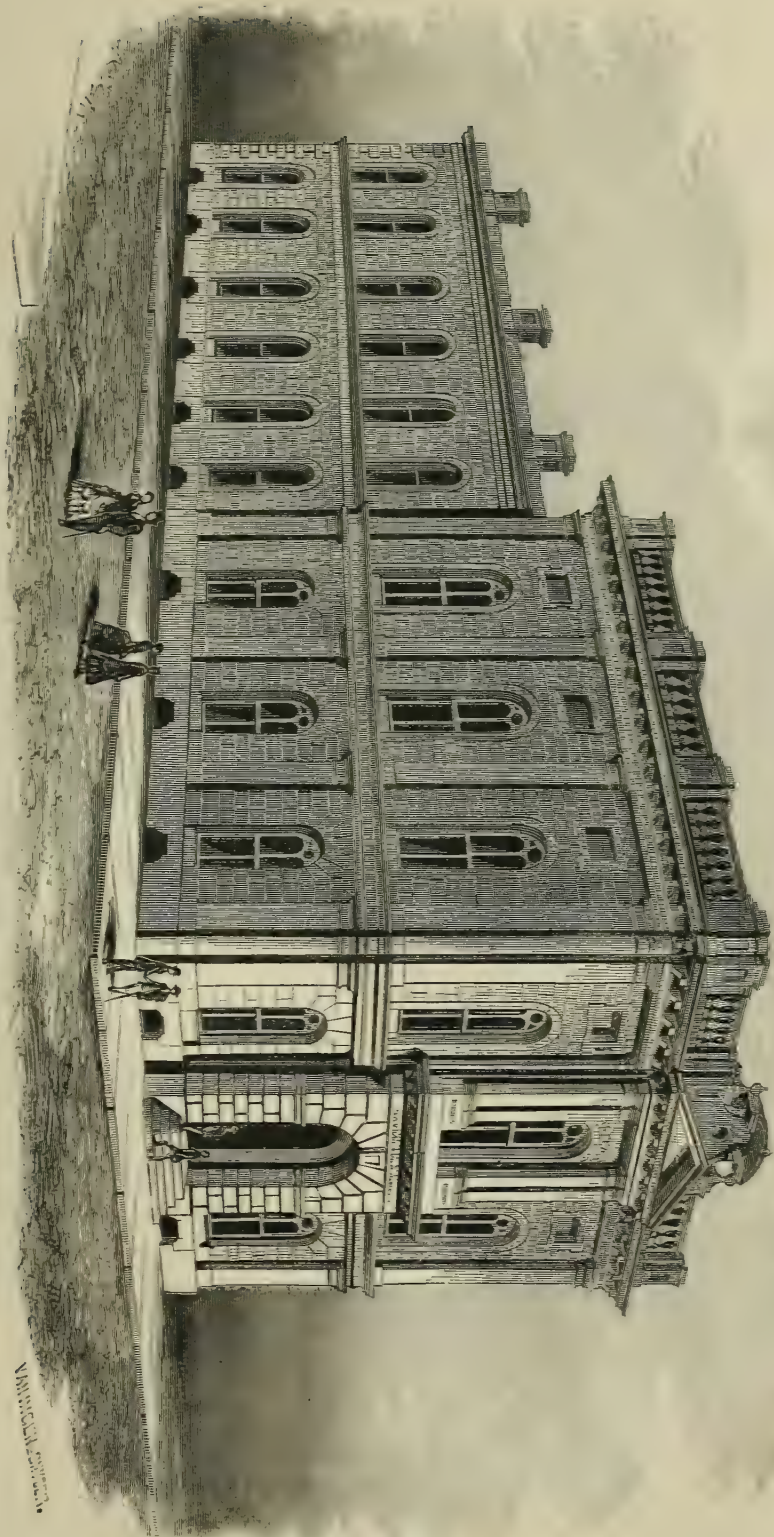
Squares in the city, nothing could be better suited to the purposes of business and to the health and comfort of the employes of the institution. Especially also is it favorable for the display of the architecture of the building. Too frequently our street views are so cramped, that the design of the architect, be it good or bad, is distorted by the unfavorable lines of vision. Here, owing to the open Square, it is otherwise. The whole structure can be embraced in a glance, and an object which in a narrow and crowded street would only be noticed as a thing of utility, becomes, largely owing to the circumstance of location, an ornament to the city.

The design adopted as the most suitable to meet the several requirements of the Society, was prepared by ADDISON HUTTON, Esq., and under his supervision the building has been enclosed during the past season.

The front on Walnut street is 51 feet 6 inches, and on Washington Square, 130 feet, in length, leaving 40 feet of clear space in the rear. To those of our readers who are familiar with the material of which these fronts are built—Quincy Granite—we need scarcely state, that the building is more handsomely than the drawing would lead one to expect. The strongly-marked expression of stability is in harmony with the character of the institution. Beyond plain lines of moulding, and the crowning balustrade, it may be said to be devoid of ornament, the architect having relied, for his effects, mainly on the distribution and contrast of light and shade, and the intrinsic beauty of the material.

But the most satisfactory of all its points is, that it is constructed with such imperishable and indestructible materials. Granite, brick and iron form the essentials of the structure, no pains or

BANKING HOUSE OF THE PHILADELPHIA SAVINGS FUND SOCIETY.



expense having been spared to make it thoroughly fire-proof. The lower floor is vaulted on walls, the upper floors and ceilings on wrought-iron beams; affording security alike from without and within.

The Banking-room is 57 by 53 feet, and the ceiling 40 feet high, in the clear. The rear wing of the building is subdivided, on the first floor, into the President's room, Treasurer's room, two large, strong rooms, and several Retiring-rooms; on the second floor, into the Managers' Meeting-room, Dining-room, Waiting-room, Book-room, and Retiring-room.

The ceiling will be coved and frescoed in panels, and the interior will be finished with walnut and ash woods, with the introduction of a portion of marble.

The counters will have marble fronts with a top screen of walnut wood and plate-glass; the floor will be laid, outside the counters, with brown and blue flag, in alternate diamond patterns.

It would be beyond the proper limits of this article, to go into the details of the furniture and decorations, but we are assured that every thing will be done with an eye to the proper fitness of things.

We may again allude to this department, when the building is entirely completed; just now we can only compliment Mr. HUTTON on the evidence of success displayed in the well-proportioned, solid and suggestive building before us, presenting, as it does, those intelligent features of Bank Architecture which, while they abjure mere meretricious ornamentation, display a dignity at once worthy of the style, and the use it is applied to.

In a former number we drew a line of distinction between the styles of finish most consonant to the respective subjects of BANK BUILDING; making the *Savings Bank* a less pretentious structure, than that for Discount and Deposit. Mr. HUTTON's design admirably illustrates the theory.

NEW JERSEY ASYLUM FOR THE INSANE.

HOSPITAL construction is a subject we have already touched upon; but it is one which must ever prove of the utmost importance to every community. If man in his perfect health requires the safeguards which keep him in that most desirable state, how much more does he stand in need of the most careful sanitary arrangements when sickness and disease usurp the place of health, and leave the system impotent, and craving every aid which his attendants can afford him. His wealth will command all that science can give; but how is it with the poorer invalid? He, alas, is forced to accept of such assistance in his suffering, as benevolence, dictated by religion and humanity, bestow. It is for this latter class, that, in every community, medical and nutritive assistance is given on a comprehensive scale, by institutions aptly designated HOSPITALS. Here the sick are the guests (*hospes*) of the community, and receive its hospitality, until health is re-established.

To the architect belongs the thorough arrangement of the hospital. All the principles involved in its sanitary perfectness are in his keeping; subject, of course, to such hints as the medical faculty can give him, and such aids as he obtains from inventions of others. In our day this branch of the professional labors is one that calls forth all the untiring diligence and careful attention of the architect, and it is something to be proud of, that he is liberally sustained, in his efforts, by the community for whom he toils.

The accommodation required for insane patients being necessarily limited in a general hospital, the establishment of institutions expressly dedicated to their wants became general. Lunatic Asylums were founded on the most comprehensive and scientific principles, and sites for this purpose were chosen, pos-

sessed of desirable natural beauties, both in Europe and this country. Some of our youngest States have shown a commendable zeal in this matter.

At St. Peter's, Minnesota, there is a State Lunatic Asylum, in course of construction, of an extent that would surprise many of our older States. But we now claim the reader's attention to the proposed Asylum for the Insane in the State of New Jersey, of which the accompanying illustrations are the perspective view and plan of one story, which we will now proceed to describe. The extent of front is near 1,200 feet between the extremes, equally divided into Male and Female Departments. Each department will have fourteen separate and distinct wards, having free access to the grounds, independent of each other.

The building, throughout, will be three stories high, excepting the extreme wings, which are intended for the most excited patients. Those wings are but two stories high, with attics to the returns, and are calculated to accommodate about six hundred patients altogether.

Each Department will consist of three distinct parallel wings, every one of which will extend back sixty feet beyond its neighbor, with returns connecting them together. The third return will extend back two hundred feet. Adjoining this are the two-storied extensions, forming the sides of a hollow square. By this arrangement, the corridors are open to the light at each end, and are, consequently, only the length of a single ward, with an alcove in the centre of each, facing the front, which answers two purposes: It lights the centre, and, at the same time, affords a pleasant sitting-room for the patients, overlooking the grounds in front. Each ward has two flights of easy staircases; one at each end. One of these is at the front, and the other at the rear. The latter communicates with the pleasure-grounds allotted to the patients. This plan is repeated in every ward. Each has its

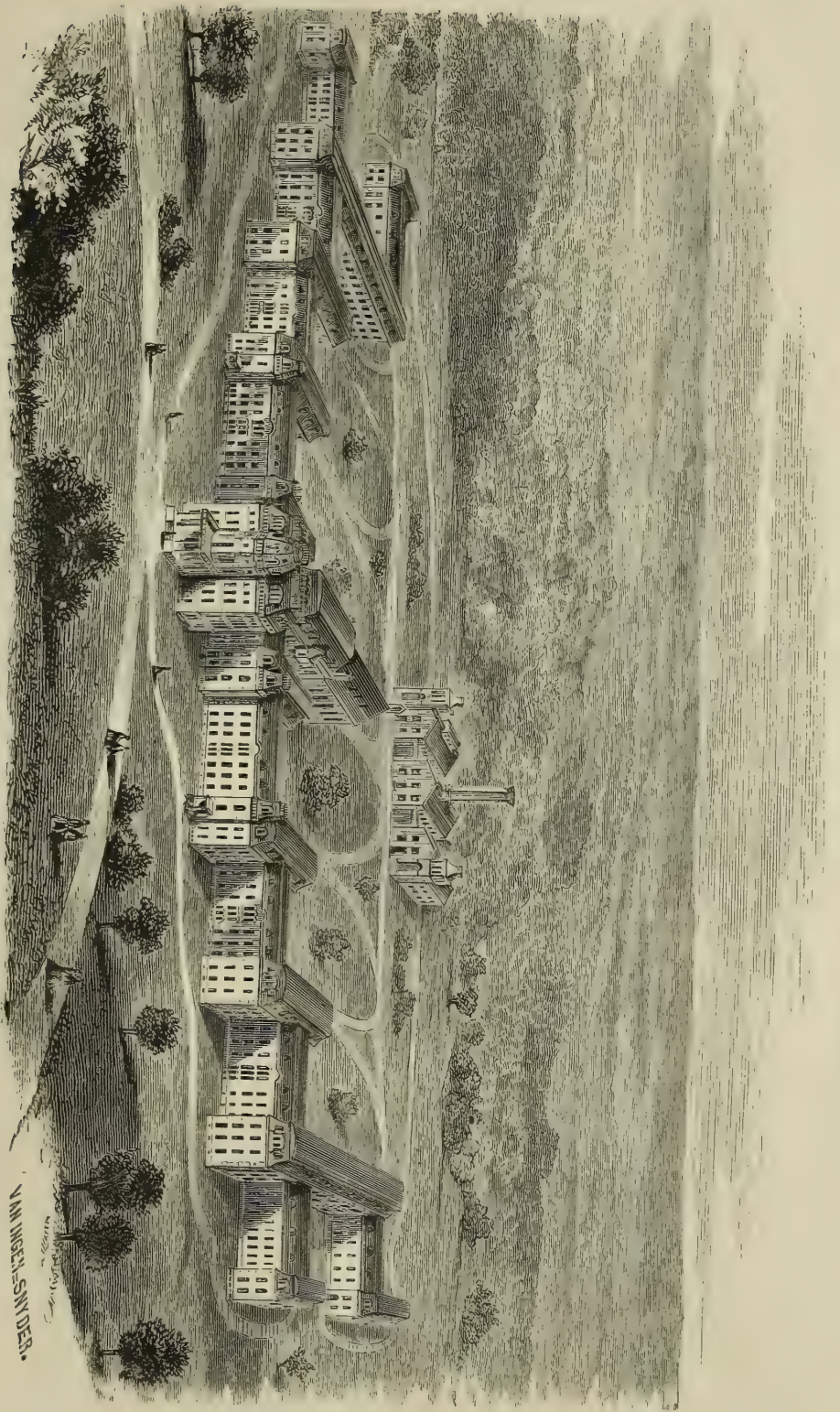
own dining-room, lavatory, and a porch which communicates with the corridor through the lavatory. Each porch is entirely private, and cut off from view, except from the windows of the ward to which it belongs.

A is the Centre Building, containing the necessary accommodations for the medical and other officers of the institution. The medical visits are greatly facilitated by the position and number of the stairs, and access to all parts of the institution by physicians, attendants, &c., rendered easy. One story is appropriated exclusively to the use of the Medical Superintendent in Chief, and his family. This building is isolated from the main structure, except the connection of a corridor, with the main centre of the hospital building. This occurs on each story; and forms a junction with a cross corridor that connects with those of the wards. At the junction first named are two parlors, right and left, for friends to visit patients. The patient enters the parlor from the cross corridor, and the visitor from the main one. The cross corridor has screen doors, to prevent free communication between the two great parts of the Hospital.

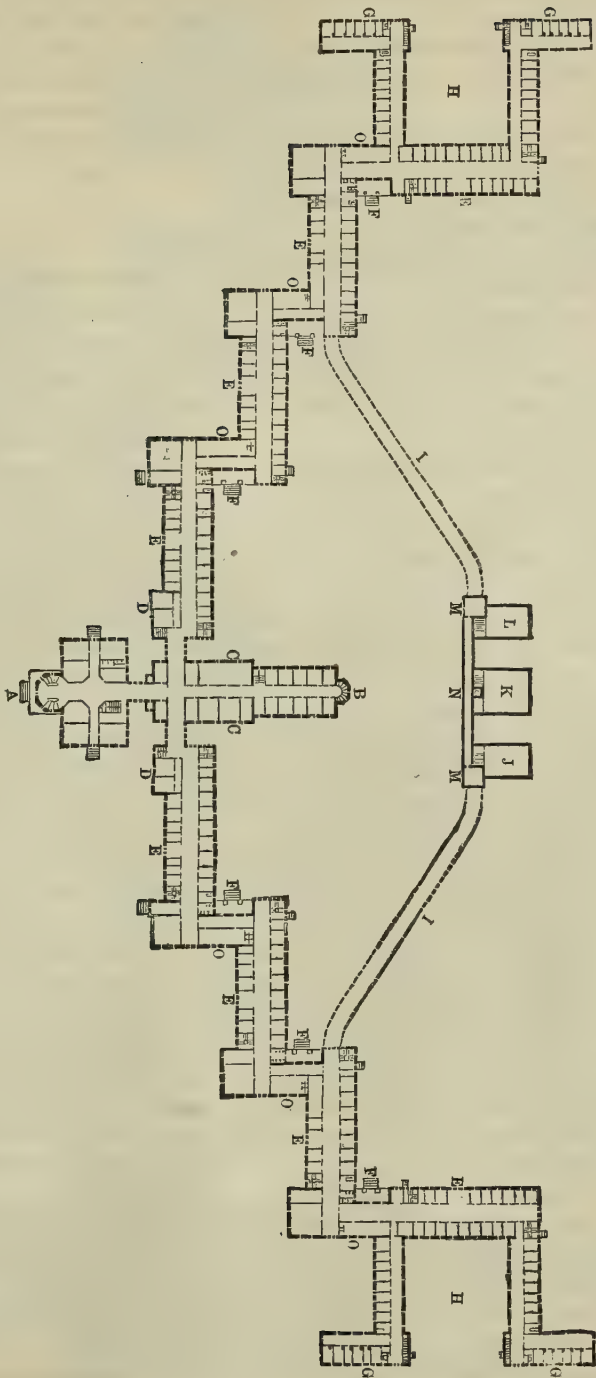
B is the Chapel Building, in the rear of the centre. The first and second story of this are occupied by the employés; one story for the men, and the other for the women, with a corridor through each. The Chapel occupies all the space above.

C C is the Amusement Hall, and on the same level with the Chapel floor. The first floor of this building is occupied as Trunk-rooms, and general Store-rooms. The second story is for the Apothecary's rooms, and is so arranged that the attendants receive their medicines, without entering the centre, beyond the limits of the screen doors in the corridors. The entrance to the chapel is through the Amusement Hall, by separate doors; one for men, and another for women, with a centre door for the officers and visitors.

PROPOSED ASYLUM FOR THE INSANE, IN THE STATE OF NEW JERSEY.



PROPOSED STATE ASYLUM FOR THE INSANE, NEW JERSEY.



D D, Rooms for sick, or private patients, having entrances from a passage off of the cross corridor.

E E E are the Alcoves in the centre of the corridors, overlooking the front grounds.

F F F are the Porches on the rear, and apply to all the stories, as well as to all the wards. They are intended exclusively for the patients.

G G, G G, the extreme wings, for the most excited patients.

H H, the Court-yards to the same.

I I, the Underground Duct, which connects with the cold-air chamber in the cellar, at the centre of each department.

J, the Workshop.

K, the Engine and Boiler-house.

L, the Laundry.

M M, the Fans within the towers; one at the workshop, and the other at the laundry.

N, the Chimney Stack, within the boiler-house. It also indicates a passage-way from one fan to the other.

O O O, Dining-rooms.

The heating and ventilating are alike intended to be on the most improved and perfect plan, by the direct current through flues, prepared for the purpose, in every room and hall, independent of each other, and connected with a horizontal shaft laid along the cellar floor; also connected with vertical shafts constructed in the walls of the stairs. These latter are three feet square each. There are two in each ward; thus giving one to each range of rooms. Those shafts are topped out high above the roof, and heated by a coil of steam-pipe to rarify and facilitate the current.

The building will be thoroughly warmed by steam generated at the boiler-house; a system which avoids the necessity for fire in any part of the establishment, except in the kitchen range. The steam is likewise used for the purposes of washing, cooking, and heating water, for bathing and other objects. A railway extends the entire length of the building, and connects

with the kitchen, which is under the Amusement Hall, being used to convey the food to the dining-rooms of the various wards, as well as to carry the clothes to and from the laundry-building, articles to and from the workshop, and for conveying stores to the upper story rooms.

THE NEW CITY HALL:

PITTSBURGH, PENNSYLVANIA.

THROUGH the kindness of Mr. J. W. KERR, Architect, of Pittsburgh, Pa, we are enabled, on this occasion, to present to our readers his accepted design for the NEW CITY HALL, AT PITTSBURGH, a building, the need of which, long felt, had become imperative.

Under Mr. Kerr's efficient direction, plans and working drawings have been prepared, and every preliminary arrangement made, during the present winter: such as forwarding the cut-stone work, iron beams for the floors, amassing bricks, and materials generally; so that, on the opening of next spring, building operations will be commenced, and pushed on with rapidity and vigor.

The Hall will be ready for occupancy some time in 1870.

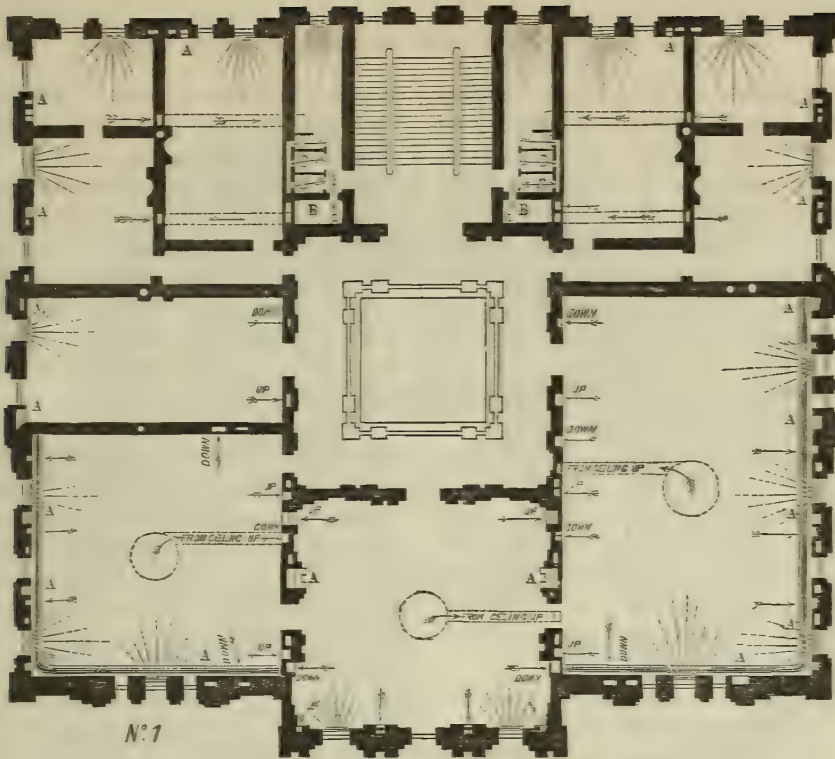
The style of the architecture is that known as "Renaissance"—similar to that of the City Hall, at Boston—being a combination of ornamental pilasters and cornices to each story, and moulded dressings to all openings.

The City Hall will have a front of one hundred and twenty feet on Smithfield street, with one hundred and ten feet depth, to the extreme rear. The body of the building will be one hundred and twenty feet long by one hundred feet deep—set back eight feet from Smithfield street, with a central projection of forty feet wide on the line of the street, forming a base to a tower of forty feet square, to be carried up in the front of the edifice. The body of the pile will have three full stories and an attic—the tower reaching two stories higher.



CITY HALL: PITTSBURGH, PENNSYLVANIA.

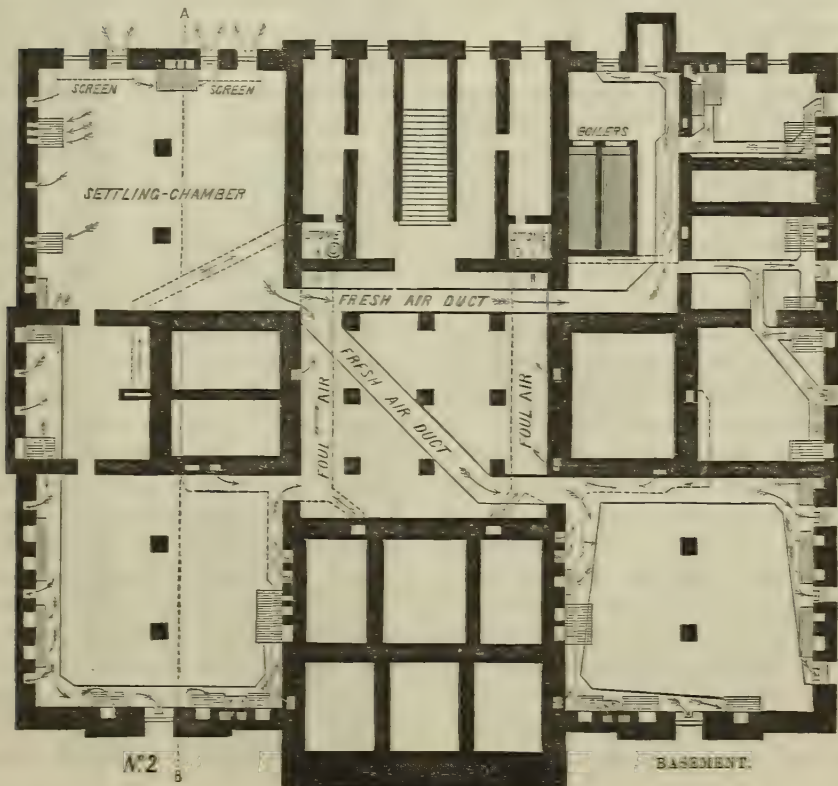
ARCHITECT, J. W. KEER, ESQ.



A A A—Hot Air Flues.

SECOND STORY.

B B—Foul Air Shafts.



PLAN OF SECOND STORY AND BASEMENT,—SHOWING THE SYSTEM OF VENTILATION,—IN THE MUNICIPAL HALL: PITTSBURGH, PA. BY LEWIS W. LEEDS.

The first floor will be raised four feet above the sidewalk; the second floor twenty-five feet; the third floor fifty feet; and the attic floor, at the main cornice, will be elevated seventy feet above the ground. The attic will have a French or Mansard roof, fifteen feet high above the crown moulding; and will be finished with an ornamental cornice and cresting of iron work.

The tower, or central projection of the front, will be carried up forty-eight feet above the main cornice, and covered with a dome, in the Louvre style, on which will be placed an open octagon belfry of fifteen feet diameter, terminating in an ogee domelet and vane, making the whole structure one hundred and seventy-five feet high above the sidewalk.

The front of the building and the upper part of the tower will be of stone, and the side and rear walls of brick, finished with dressings of stone around all the openings. The dome and belfry will be constructed of iron, and the dome covered with copper.

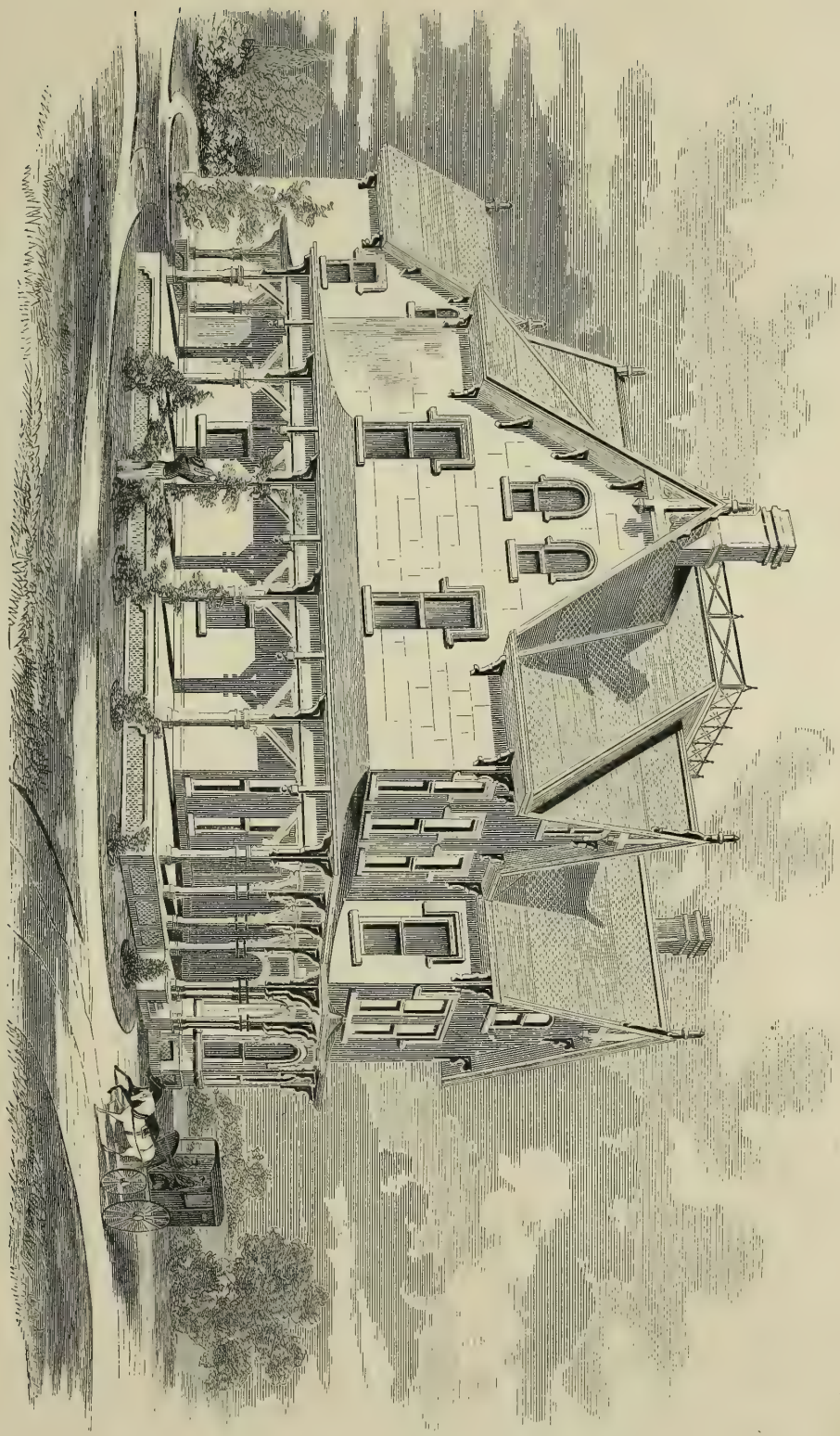
The belfry is intended to receive the Fire-Alarm Bell; and the upper stories of the tower, and the dome, are intended for the use of the Fire Department and Alarm Telegraph.

At the top of the tower, and in the base of the dome, will be clock faces of eight feet diameter—one on each of the four sides of the square—which can be seen from all parts of the city and Allegheny. The main entrance to the building will be through an arcade, on the first floor, of three openings, six feet wide each; this arcade forming a porch of fifteen feet deep by thirty-four feet wide. From this arcade we enter a main doorway, of six feet wide, leading through a vestibule, twelve feet by sixteen feet deep into a central rectangle of thirty-six feet square. This rectangle will run up to the roof, having galleries, six feet wide, carried around, at each floor, from which doors will communicate with all the rooms, and be sur-

mounted, at the roof, with a raised skylight, that will be arranged to form a ventilator for the whole building. On the rear of the rectangle will be placed the stairway, twenty feet wide by twenty-nine feet deep, extending to the back wall of the building, having large windows in each story. The stairs will be built of stone; and will have a central flight of eight feet wide, and two side flights of five feet each.

The first floor will have the Mayor's offices, placed on the right side of the entrance, with a side door entering from the arcade; and will consist of a Court Room, thirty-six by thirty-seven feet, a Clerk's room of nineteen feet square, Chief of Police's private room ten by sixteen feet, and a private room for the Mayor fourteen by eighteen feet. In the rear of the Mayor's offices, and entering from the central rectangle, will be a public office, eighteen by thirty-six feet, and a private room of fourteen by eighteen feet, for the City Surveyor and Engineer, who will have private rooms for his draftsmen placed on the third floor. On the left side of the first floor will be placed the offices of the City Treasurer and Controller, each with a public room of thirty-six by thirty-seven feet, private rooms of eight feet by nineteen feet, and vaults of seven by fifteen feet—the public rooms having side entrances from the front arcade and the central rectangle.

On the second floor, in the front of the building, will be placed the Council Chambers. The Hall of the Common Council will be thirty-six feet wide by fifty-six feet long; and that of the Select Council thirty-six by thirty-eight feet, there being a connecting hall between them of thirty-five feet square, for a general Committee Room—all being twenty-four feet high—the Committee Room being in the middle of the front, with windows opening on a balcony over the main entrance, and intended to be used as a Public Reception Parlor. On the rear of the Select Council Cham-



AMERICAN BRACKETED VILLA.

ber will be a room nineteen by thirty-seven feet, for a Library and Museum of Pittsburgh Art Productions. The balance of the second floor is arranged with Committee Rooms, and offices for the City Solicitor and Assessor of Water Rents.

AMERICAN BRACKETED VILLA.

THE illustration we here present is a perspective view of a Villa erected recently near Philadelphia. It is in our *National Bracketed Style*, which, in rural architecture, so prevails in this country as to entitle it to that distinctive name. It is constructed of brick, standing on a basement of stone, and

having stone trimmings. The substantial verandah, with its capacious shade, adds beauty and comfort to the dwelling. The gabled projection of that portion which is embellished with a bay-window tends, with the other gables on front and side, to break up the lines, and prevent that monotony, which must otherwise have had such a very disagreeable effect on the observer.

The arrangement of the plan is calculated to give ample accommodation, and that convenience, which tends so much to domestic comfort. The following is a description of the plan, as built :

- A, Hall with staircase.
- B, Drawing-room. C, Parlor.
- D, Dining-room. E, Stairs.



F F, Butler's Pantry, with slide.

G, Kitchen.

H, Summer Kitchen, with servants' stairs.

I, Back Stoop, or covered exit.

J, Verandah.

The cellarage is ample and well lighted.

The second floor is portioned off into bed-chambers, closets, and wardrobes; two chambers being over the Drawing-room, B, and one over the Parlor and Dining-room.

The high pitch of the roof gives capacity for good attic bed-rooms, and the Kitchen wing amply supplies the domestics with sleeping apartments and a garret.

The roof is so constructed as to have a platform on the top, which is strongly, yet simply balustraded; giving a good, roomy place for observation, &c.

In this scheme, as in all such as present large roof surfaces, it is necessary to introduce ornamental courses in the slating; and, when this is effected in a tasteful manner, the extent of roof surface tends to heighten the effect of the whole composition. The chimneys, too, must be made to form prominent features, tending to carry out the general design.

Such a Dwelling as this could be constructed of framing, sheathed and clap-boarded, having the wall-spaces filled with dry brickwork; a practice which makes a warm house, and inexpensive, from the fact that the coarsest bricks answer for the purpose. Another method, now coming generally into use, is the tacking on of *felting*, to the sheathing, around the building, so as to utterly exclude the external air, which might otherwise find its way through the walls; as well as to retain the artificial warmth of the house inside. There are other, and cheaper materials for this purpose, chiefly made of brown paper; but, whatever is used, provided it answers this desirable end, must add greatly to the comfort of the dwelling.

For evidence of possessing comfort, the appearance of this style is very favorable; and must, on that account, at least, make it always popular for suburban residences.

BAPTIST CHURCH,

DARLINGTON, ENGLAND.

OUR illustration shows a perspective view of the new BAPTIST CHURCH, AT DARLINGTON, ENGLAND, designed by Mr. WILLIAM PEACHEY, Architect, which he has been kind enough to send us, for publication in our pages. The style is that which has of late years become so justly popular in England, through the highly successful examples of Professor SCOTT, whose admirable taste has gone far towards its establishment, not alone there, but here.

The treatment of the present subject by Mr. PEACHEY is deserving of praise. He has produced most artistic effects of light and shade; and the general *coup d'œil* is all that could be wished. There is no repetition in it; all is singularly striking, and each feature is perfect in itself. The tower has an air of solid utility, as well as intrinsic character, in it; and it occupies the very position it should fill. Its spire, too, is in just keeping with the whole composition; having a squareness about it, that fixes, as it were, the idea depicted. The various and varied openings of windows and doors, are so well managed, as to help out the perfect whole. In fact, while this charming composition presents all the embellishment its style will admit of, there is not the slightest approach to redundancy.

Mr. PEACHEY informs us, that this Church is not yet in a finished state; as the portion to the right of the tower is not yet built. Judging from the photograph of the design in its entirety, we have no hesitation in saying, that its completion is to be wished by all, who would admire a really deserving work of Architectic Art.



BAPTIST CHURCH, DARLINGTON, ENGLAND. WILLIAM PEACHEY, ARCHITECT.

CARPENTRY AND JOINERY.

ITS HISTORY AND PRACTICE.

THERE is no one art, connected with Building, which deserves more consideration than that of CARPENTRY, whether taken in its rough form, or its finer application, which we call JOINERY. The former term is applied to the working of heavy timbers, framing, and constructing the essentials, which constitute the stability of an edifice. It is valued by the cubic foot. The latter term includes all the interior finishings and ornamental work; and is valued by the foot superficial.

In all new countries, where timber is the most used of all materials for building, the various modes of *framing* are studied, and practised, to the utmost extent of scientific information on the subject. A thorough knowledge, therefore, of the relative strength of timbers of various sorts, and the strains to which they may be safely subjected, under certain disposition and arrangement, is absolutely necessary to the Architect who designs, and to the Builder who constructs edifices.

The young Carpenter, who desires to excel at his trade, would do well to study and closely observe the geometrical rules, which govern every line of his work; and not to be content with merely following in the track of those, who went before him, without even attempting to understand the mechanical construction of the work, he has just put together. He should acquire a knowledge of general elementary principles, at least; and furnish his mind with all that desirable information, which would enable him to select the best materials, and employ them in the best manner.

Unless the builder possesses a considerable knowledge of the principles of mechanics, and is thoroughly acquainted with the effects of pressure and the relative strength of materials, he cannot possibly construct any work with that

confidence, which commands success. Unless he knows the surest modes of uniting timbers, he cannot undertake those operations, which require framing. Hence the necessity for the beginner applying himself in earnest, until he acquires a complete understanding of all the knowledge, within the range of the art.

The practice of CARPENTRY, in its rudest form, must, of necessity, have commenced in the very earliest ages; for, in the first attempts at the construction of the primitive buildings of those days, Carpentry must have been brought into exercise.

It is probable, that the introduction of the pediment roof gave the first idea of *framing*.

The Egyptians and Greeks, using stone in all cases, Carpentry made but little progress amongst them. The Romans used timber; and consequently found the necessity for a knowledge of uniting timbers. They also used wood for cornices. In fact, the early theatres and amphitheatres of Rome, and of many parts of Italy, were constructed entirely of wood; even in the Golden Age of Augustus Cæsar. The timbers of the roofs of Roman buildings were often exposed at the ends; and these were carved and gilded, as in the case of the basilica of St. Peter, erected by Constantine the Great. Sometimes they were encrusted with bronze.

The modern Italians appear to have given more attention to Carpentry, than any other people. One of their authors, SERLIO, lays down, in his voluminous works on this subject, some excellent rules for the framings of floors with short timbers; and many of the writers on the same subject, of our own time, have taken valuable hints from Serlio.

Sir Christopher Wren was undoubtedly the most scientific of all the English publishing architects, who had treated on framing, down to the times of Charles II.; and since his day numerous works have appeared; but all so

extravagant in price, owing to the necessarily numerous engravings, that they each had but a meagre sale; and few of them ever reached the hands of the working Carpenter.

The French made many improvements in framings; especially the system of curbs for domes. And many of their old cathedrals are even at this day worthy of attention. Their construction of centering for arches is far in advance of all cotemporary nations. The Germans likewise invented several good methods of framing.

Our countrymen are largely indebted to Mr. Peter Nicholson, so famous amongst English writers on Carpentry, for much valuable information, which has had the effect of drawing forth the inventive genius that is so characteristic of them; and many remarkable works have been constructed, on the best principles of framing, which are highly creditable to our nation.

The applicability of Iron, to all the uses for which framing is required, has led to a still closer study of the subject; and Carpentry, instead of losing, on the contrary gains prestige, by the adoption of many of the methods of construction, which that material furnishes; and, by taking advantage of the many braces, kneelers, shoes, &c., which cast-iron presents.

That Carpentry is a subject of very great importance, there can be no doubt, when we consider the paramount necessity there exists for its presence in Building. The fact is a conclusive one, that builders, almost invariably, are practical carpenters. And, that they should be such, is very clear; seeing that it is the business of the builder to lay out the lines for the building; to furnish all the necessary wall-plates, flooring, frames for doors and windows, roofing, &c. Whilst other mechanics devote their attention exclusively to their own particular trade, the Carpenter has the care of the whole; and is, in truth, a *fac-totum*, to whom all the branches of mechanic skill look as to a leader. No

one, concerned in the various operations of construction, takes such an interest in the whole work as the Carpenter. Hence the ease with which he can assume the *role* of Builder; and the confidence with which he becomes a Contractor for structures of any extent or cost. The Architect himself must acknowledge the Master Carpenter as his lieutenant, to whom he gives the custody of his plans, and to whom he looks for the execution of them. A necessity for a thorough knowledge of all the scientific requirements of his position demands of him an application to their study, which will make him truly a MASTER BUILDER. And in that knowledge lies the power to economise material, without incurring the loss of strength.

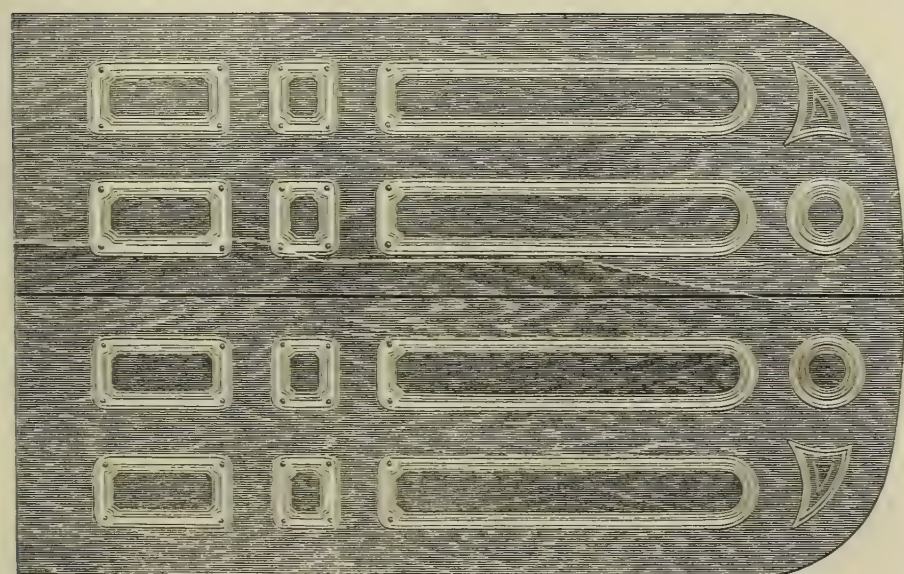
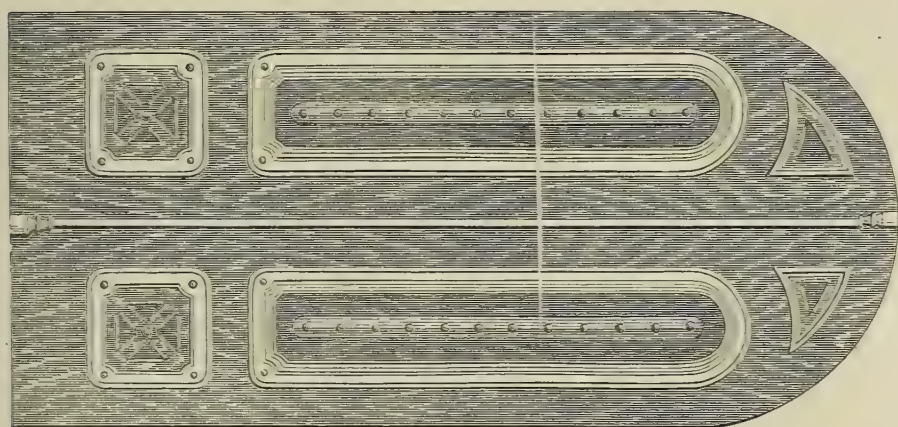
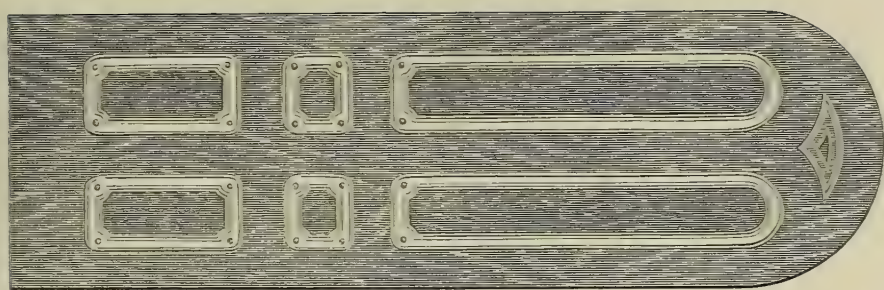
The peculiar province of the CARPENTER is to prepare piles, sleepers, and planking, or other large timbers, for the foundations. Centerings to vaults, wall-plates, lintels, and bond-timbers, naked flooring, partitioning, roofing, battening to walls, ribbed ceilings to form vaulting for lath and plaster, &c.

The selection of a Carpenter is one of the most important things, which concern a building. For, no matter how excellent may be the designs of the Architect, the best points of his plans may be irretrievably lost by the ignorance of this one mechanic, so much does success depend upon his ability to execute.

The MASON cannot turn an arch, without his *centering*; and the correctness of that arch will depend on the truth of such centering.

The PLASTERER is likewise dependent on the Carpenter, for his *grounds*. And here again the accuracy of the Carpenter is absolutely requisite.

The SLATER looks to him for his field of action. And, in fine, every single artisan, as we have said, is subordinate to this chief; who, call him Contractor, Builder, or Superintendent, is the CARPENTER; and must possess the knowledge required for his office, as controller of the works.



FRAMED DOORS.

THERE is no feature of joinery which so indicates the style of finish, in Civil or Ecclesiastical Architecture, as the *Doors*. In Domestic Building, they are especially prominent and noticeable. We have often seen an otherwise very effective interior, utterly spoiled by the tastelessness of its doors.

And, it is not alone the design, which does credit in this matter, it is the style of execution in which that design is carried out. A poorly-constructed door is, of all other details of a building, the most unpardonable. It comes under close observation oftener, and is, in fact, the object with which we become palpably intimate. If there be any fault in design or construction, we at once detect it; for, we not alone handle the door, but in opening and closing, we bring it into different lights, as well as positions, so that the scrutiny is complete, and the work must be capable of standing it. The style of finish of doors is, in the present day, a great improvement on that of preceding times. We do not allude to the casing, and its finish; we simply confine our observations to the door itself; and, in so doing, we accompany our observations with three examples, to assist the reader in forming a judgment on the subject. Artistic effect is the ruling thought in our modern door-making; and the giving an appearance of solidity without actual heaviness of stock the next; in other words, to construct a thick door, out of comparatively thin material. Our ancestors were in the habit of giving the full thickness, both in appearance and fact. That we may produce the effect now called for, a good deal of judgment is required in the formation of panel-mouldings, for it is in that portion of the door this effect must be produced. In order to obtain the desired end, it is necessary to run a raised moulding around the outer edge of the panel, and

thus deceive the eye, by giving an additional depth, as it were, to the bed of the panel, by raised moulding around the middle, and sometimes raising this middle itself, through an added layer, and even yet another, with ornamental buttons, which, in practice, are usually termed studs—as shown in illustration.

Segment and circular heads are very fashionable now-a-days; and the designer is occasionally puzzled to know how to fill up the dead space which intervenes between the long panels and the circumference of the head, the field for invention being rather limited in Romanesque, or Norman, although amply suggestive in the various forms of Gothic.

The illustrations here given are of doors already executed, and are admirable specimens of joinery. They are put together, without mortice or tenon, by doweling, and gluing the frames with well-selected walnut veneer one-quarter inch thick. The core is of white pine, made in two thicknesses, and glued together. The panels are veneered with about half the thickness of that used on the frame.

No. 1, represents a pair of sliding doors, with elliptic tops, the middle panels of which cannot be raised higher than the side, on account of the peculiar office of these doors, making such raised panels an obstruction.

No. 2, is a Front or Hall Door. In this case the middle panels are raised and ornamented with studs. This door has a very good effect, the mouldings are not overwrought, as is too often the case, but the play of light and shade is very pleasing. The base panels give a peculiar effect of strength, just where it is most called for; and the rounding off of all angles in the prominent panels is an improvement on the old style.

No. 3, represents the doors of the principal rooms. The design is simple, yet highly effective; and, executed as these and the other doors, here given, are, proves to be eminently satisfactory.

The material is black walnut. Some architects are in the habit of inserting light-colored woods in their mouldings, and sometimes have the panels bird-eye maple, butternut, yellow pine, &c., when the door is walnut, rosewood, or mahogany, making a bright contrast. This practice must, of course, be controlled by the taste of the client, unless such matter be left in the hands of the architect, to use his own discretion; and where there is a confidence in his ability and taste, as displayed in other like designs, the client will, most likely, adopt the architect's judgment, especially if not varying much from his own. We have seen very rich effects produced by this intermingling of various woods, which obtains especially in the first-class residences of New York. For our part, we prefer the darker woods. With walnut, we would introduce a slight mixture of ebony, if treated with care, and properly distributed through the smaller members of the mouldings; and studs should be subordinate, and only used to such extent as to form a pleasing contrast with the tone of walnut, rosewood, or mahogany. Some architects are fond of using carved mouldings, such as *ovæ* and *foliations*. We admit that rich effect is the consequence; but, does this display of elaborated design repay the extra outlay? and again, is such display in good accord with the structure it is intended to adorn?

The difficulty of keeping minute carving free from the accretion of dust, is not the least objection to its use. And when we look at the beauty attained in straight or curved lines, in mouldings whose sections display true taste, we cannot endorse the idea of clothing them in meaningless foliage, &c. Exuberance of ornament was a fault with architects of a bygone day, which we hope our professional brethren will be cautious to avoid, ever bearing in mind the quaint, yet excellent maxim,

"Beauty unadorned, is adorned the most."

Whilst preparing the foregoing paper, we were favored with the following letter from a valued contributor:

Philadelphia, Jan. 18, 1869.

EDITOR "ARCHITECTURAL REVIEW,"

DEAR SIR: I have so frequently been struck with the excessively bad taste displayed by those, from whom good taste might be expected, as an inherent quality, with regard to the use and abuse of the American Walnut wood, that I cannot forbear giving an expression to my ideas through the columns of your very valuable and much-needed Review.

But few years have elapsed since the introduction of Walnut, as applied to the general purposes of architecture; yet, it is, to-day, an element deemed essential in the construction of every handsome dwelling, store, or even counting-room, and, in fact, many of the smaller class of residences now come out in all the glory of walnut wash-boards, walnut inside-shutters, and, above all, that indispensable ensign of gentility, a walnut front-door. No matter, if the completion of the building for a given sum necessitates the adoption of a rigorous "skinning" process in its construction; no matter if the door is almost thin enough to be translucent; only let it be of *Walnut*, and we have reached the great desideratum, and feel ourselves (in our 16-feet front house, perhaps) several feathers lighter in the scale of elegance, than our neighbor, who, in his larger domicile, is entrenched behind his plebeian panels of pine.

That the female members of our community (Heaven bless them!) have something to do with these sentiments, I think no one will deny. If their first question, to their amiable lords, is invariably, "Has the house a walnut front-door?" who can blame said lords if, in the overflow of conjugal affection, they naturally come to regard walnut front-doors as a *sine qua non*?

And, granting that they do arrive at

this conclusion, who can blame those of our builders, who are largely interested in "getting up" houses for market, if they cater to the public taste, (even though it be a vitiated one,) and, in turning out "sale" houses by the block, always see to it, that they are made respectable, by the *shrinking* loveliness of walnut front-doors?

Now, sir, it is the farthest from my intention, to condemn the use of Black Walnut for doors. I think it is decidedly more elegant, richer, and better suited to the requirements of architectural beauty than any thing yet employed for that purpose; but I also think it should only be adopted, where the surroundings are "*in keeping*," and where the general appearance of a building warrants the supposition that its interior details are upon a scale commensurate with its external appearance.

Moreover, a walnut door should always be well made and *show* that it is well made, in order to be in the slightest degree ornamental. The eye is continually offended, now-a-days, by wretched-looking mulatto-colored doors, whose gaping joints and cracked panels (to say nothing of their naked screw-heads, whose thin putty covering was washed away in the first rain) seem to say, "I'm not worth much, in dollars and cents, but I come of a good stock!"

In truth, a Walnut door should not have a particle of hardware about it, except the hinges and lock. A veneered door, (clear walnut on clear pine,) where nothing but glue is used, will withstand any ordinary exposure, and outlast any other kind, in nine cases out of ten; but the cost of making such an one would probably be more than the entire margin of profit on many a house, whose front bears one of the mulattoes above alluded to; consequently, the idea is impracticable; and we are forced into the conclusion, that a neat, white door is that, which good taste would dictate, in the building of small, cheap residences.

Again, we may see a great abuse of Walnut, in the fitting up of rooms. A small sitting-room, for instance, whose entire cheerfulness and comfort depend upon its being light and airy-looking, is rendered heavy, contracted and dull, by inordinate use of walnut in washboards, sashes, jambs and mouldings; or a cosy little library is turned into a caricature, by the alteration of the doorways and window-places into *walnut* arches, in the "Tudor" style, perhaps, having the enormous-altitude of *six-feet-six*!

I think, Mr. Editor, that these matters are deserving of some attention, at the hands of those who take an interest in the improvement of American taste, and in that view, give publicity to this scrap of gratuitous criticism, through the medium of the "Review."

Respectfully yours,

F. H. WILLIAMS,

Seventeenth and Spring Garden Streets.

INVERTED ARCHES.

AS USED IN FOUNDATIONS.

CONCRETE has, since its introduction into building, done much towards the equalization of ground for foundations; yet there are some instances of very heavy buildings, with wide apertures, requiring the use of inverted arches; and, indeed, in no such cases should their help be declined by the judicious architect. We very seldom see a large building, some of the openings of which do not exhibit a *cracked lintel*. The exceptions are really so few that the rule may be considered absolute.

It must be obvious, that inequality of pressure is the reason for the presence of fractures such as these, and that such inequality has not been adequately provided against. The ground, however well rammed, cannot be expected to remain always uniform under unequal pressure, especially when acted upon by the influence of moisture, either from

above or below the footing-course of the foundations. And it constantly happens, that certain soft spots will lie in the way, over which Concrete, unless very thick, and consequently very expensive, has no control. Such a spot may occupy the site of an opening, and should be supplied with an inverted arch, which will have two piers resting on its haunches, and thus bind them together on one level, preventing the unequal sinking, so generally fatal to good construction. But, in case the soft spot should occur under a pier, then it will be necessary to build piers on the firm ground and turn an arch over the spot, on the top of which the required pier can rest. We here speak in the singular number, but it will be understood that many such, if needed, may be used, always providing inverted arches under the apertures, for the reason before given.

The parabolic form is the best for such arches. It is the surest for resisting *thrust*; and, besides this, it has the advantage of not having to be sunk in the ground so deep as the semi-circular arch.

The execution of these inverted arches should be very perfect; as, any settlement in them has a bad effect on the

piers, depending upon them, and consequently gives opportunity for that fracture, which their presence was intended to obviate. Inverted arches may be constructed with facility by moulding their backs in the ground to be occupied by them, and this may be very exactly done, by pressing down an inverted *centering*, removing it, and smoothing the bed. The setting of the brick or stone then becomes an easy matter.

Besides in foundations of buildings, inverted arches are constantly used in constructing sewers.

Fig. I. Shows the inverted arches under apertures.

FIG. I.

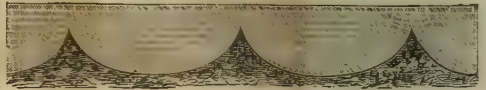
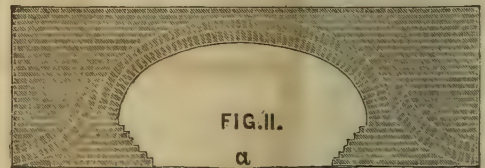


Fig. II Shows a relieving arch over soft spot (a).



THE VENTILATION AND WARMING

OF THE

MUNICIPAL HALL, PITTSBURGH, PA.

BY LEWIS W. LEEDS.*

THAT there should be some artificial force, or power, used to produce the proper movement of the air, in any occupied building of considerable size, is now universally admitted.

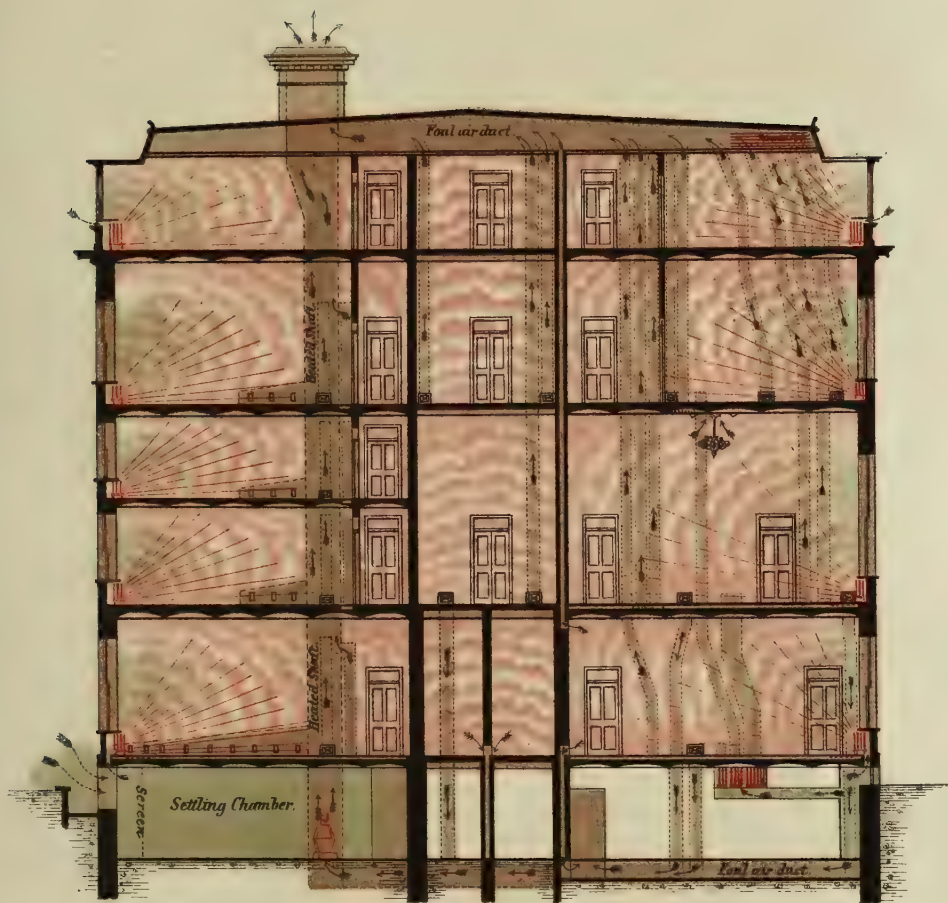
But, as to the best manner of applying that force, opinions differ greatly.

Many engineers think, that there is nothing equal to a fan, for forcing in

the fresh air, and, in addition to that, some use a fan, for drawing the foul air out.

Others prefer to depend upon the movement caused simply by a variation of temperature; and consider, that the same amount of heat, required to run a steam-engine, to drive a fan, if applied directly to a well-constructed shaft, will

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J.W.Kerr, Arch^o

SECTION
 Showing
VENTILATION & HEATING
 OF THE
MUNICIPAL HALL, PITTSBURGH, PA.

by LEWIS W. LEEDS
New York.

move a larger amount of air, at a much less cost, and in a more gentle, uniform manner, causing less unpleasant draughts.

There can be no doubt of the possibility of adjusting the velocity of the fan, and so distributing the inlets and outlets of the moving air, and proportioning the sizes of such openings, that, by skilful management, almost any effect desired could be produced.

But, as the traveler on the road, asking if the direction he was going would take him to Boston, received for answer, "Yes;" but, on inquiring the distance to that town, was told that "it was a little more than twenty-three thousand miles in that direction; but, if he would just turn around, and go the other way, it would be about ten miles"—so, while there is no doubt of the possibility of moving the air in any direction, or with any velocity, we please, by fans and steam-engines and skilful engineers, yet, if there is a shorter and easier way of accomplishing the same object, let us turn around and go that way.

We should understand, in the beginning, that all artificial warming and ventilation is, we might almost say, a great nuisance. It is certainly much trouble to supply an abundance of fresh air, properly warmed in cold weather, and so distributed, as to create no unpleasant draughts in any part of the building; and, as to change its temperature materially, detracts from its freshness and purity, it must necessarily be inferior to the natural condition of the external atmosphere. But, until we get to migrating, as the birds do, in spring and autumn, so as to keep in a warm climate, we shall have to continue supplying ourselves with artificial heat, no matter at what cost of money and care; and it is almost time for us to commence making an attempt at supplying ourselves with partially pure air. We should take the natural conditions of the atmosphere for our guide, as far as possible. Man is an artificial animal,

in many aspects. He can thwart, or reverse, some of the minor laws of his creation, but frequently pays heavy penalties therefor.

To be sure, in all our buildings, the warming of them and their ventilation are almost entirely artificial; but we should endeavor to imitate, as nearly as may be, the action of the great source of heat and motion, the Sun; and the nearer we can imitate, and follow, the natural movement of the air, the nearer we will come to perfection. By reference to the accompanying plans, it will be seen, that all the heating, both by direct radiation and air currents, is placed around the exterior walls, at and below the floors; because: In the first place, we want the greatest amount of heat, where the greatest amount of cold is, so that they will neutralize each other, and produce an uniform temperature over the whole room: Secondly, the inlets of the fresh air are on the exterior, and the outlets for the foul are mostly towards the interior, because the Central Hall in this, as in all other cases, is the great natural ventilating shaft. Although it is very necessary to have other ventilating shafts, that can be definitely controlled, for special and specific purposes, yet, in a large public building, with the doors opening and closing continually, it is impossible to prevent a great central shaft, of that immense height, from becoming a grand ventilator; and, when all other arrangements are made in accordance with this fact, it is very desirable that it should be so.

Now, if the arrangements for heating were placed in the interior, and near the hall doors, as is usually done, then, the moment those doors were opened, the heat would rush out there; and the cold air would suck in, at the opposite windows, sweeping across the whole room to the hall, chilling every one, in its passage, and causing universal dissatisfaction and complaint.

But, if the floors and exterior walls

can be kept to about the temperature of the body, 98° ; and if the excessive cold of the windows is counteracted, by steam radiators under them, then the transoms, over the doors, may be left always open, and even the doors themselves could be safely left open, much of the time, forming a liberal and excellent ventilation.

If, however, we should allow the main hall to become the ventilator for the water-closets, the boiler-room, &c., it would be an offence to the whole building. Separate ventilating shafts must, therefore, be provided for these; and it is also necessary, to have a separate arrangement, for the ventilation of each room, in case it is desirable to close it entirely; and thus disconnect it from the main hall.

For this purpose, two large shafts have been provided, by the architect, communicating most directly with the water-closets, and by direct or lateral ducts, with exits in the floors of every room in the building, as well as with exits directly over the chandeliers in the ceilings in the principal rooms.

There is another advantage to be gained by the use of these shafts: In spring and autumn, when the external atmosphere is too warm to require sufficient additional heat to cause the necessary motion of the air; and yet too cold to allow of the windows being open:—then, by heating the air, in these shafts, by steam-coils, if the boilers are in use, and, if not, by an ordinary stove, or furnace, that will be placed there for that purpose, the air will be set in motion over the whole building.

It is just at this point, when the closest comparison should be made, between the values of the fan and the heated shaft, for moving the air, because in winter—when there is a considerable difference of temperature between the external air and that in the building—all the flues draw freely, and it is very easy to keep up sufficient circulation; and in summer—when the windows are

all open—a fan would be perfectly useless.

The Ventilating Shafts, as shown on the plans and section, commence at the foundation, four feet by seven, in the clear each, the two giving an area of fifty-six feet.

Their capacity is increased, thirteen square feet each, where the additional foul air ducts enter, above the fourth story, thus giving an aggregate of eighty-two square feet of ventilating flue.

Now, we want to know how much air these shafts will move; and how much coal will be required for the purpose.

Of course, in making these estimates, we lay aside all other sources of motion, such as the artificial heating, external currents, &c.; and suppose the air in the building to be perfectly stagnant. Such conditions would scarcely occur six days in a whole year; but then those six days must be fully provided for.

One pound of coal will heat from thirty to forty thousand cubic feet of air 10° . Now we find, theoretically, that a temperature of 10° , in excess of surrounding atmosphere, will give, in a chimney one hundred feet high, a velocity of more than eleven feet per second. Suppose then we allow the six feet for friction, (which would be larger than necessary, in a flue of that size, made perfectly smooth,) we still have five feet per second for the velocity of the moving current; and this, I believe, will be generally exceeded in practice. Eighty square feet, for size of shaft, with a velocity of five feet per second, gives 24,000 cubic feet a minute, or 17,000,000 (omitting the fractions) in a day of twelve hours. This would be an abundant ventilation for this building.

Now, to warm these 17,000,000 cubic feet 10° in the shaft, for the purpose of giving it this motion, would require only 566 pounds of coal, supposing 30,000 cubic feet to be heated by one pound, which is a small allowance.

Let us compare this result with that

of the fans in the Capitol at Washington, probably the most perfect in construction of any in this country, if not in the world. According to the report of the Engineers, they burn in summer, for running the fans for ventilation, 3,000 pounds of coal in eight hours. This supplies the two engines, one of 30-horse power to drive the fan for the House of Representatives, and one of 16-horse power, for the fan of the Committee rooms, &c.

I have never seen the record of any accurate experiments giving the actual amount of air delivered; and the amount, as guessed at by different parties, varies greatly. Some give it as high as 60,000 cubic feet per minute, for the large fan, and 30,000 for the smaller one. But the Engineers say, that 40,000 for the larger one, and 25,000 for the smaller, is quite as much as they ever deliver, per minute, in practice. This, for the eight hours they are running, gives 31,000,000 cubic feet, or a fraction over 10,000 cubic feet of ventilation for every pound of coal burned, instead of the 30,000 delivered, where the heat is applied directly to the shaft.

Now this saving of the two-thirds of the coal, is but one of the very small items in favor of the heated shaft, as compared with the fan. The fan requires the constant employment of a competent engineer, in addition to the fireman demanded in both cases.

We must consider, as above stated, that there are scarcely six days, in the whole year, during which, such a stagnation occurs, as would require the whole power of the flue or fan. On the other 360 days there is sufficient difference in the motion of the external currents, to produce the required ventilation; or the difference of temperature, within the building and out, would accomplish the same object. On all of these 360 days the shaft is doing its work quietly and efficiently, night and day, without any trouble to, or assistance from, any body or thing. But the fan requires the constant attention of the engineer.

Although it may be possible, so to adjust the inlets and outlets of the moving air, and the velocity of the fan, as to avoid unpleasant currents, and not to create an undue pressure; yet, in practice, this is found to be so difficult, that it is seldom accomplished. If the outlets, from any cause, become partially closed, the power of the fan is such, that it drives in the air, until it becomes compressed, like the air of a diving-bell, inevitably causing headache.

I think the gentle motion given to the air, by the few degrees difference in temperature, very much pleasanter; and not liable to any such abuses.

An effect will be produced, however, with just as much certainty, in proportion to the power used.

Taking all things into consideration, I think the heated shaft is at least ten times as valuable, for the purpose of ventilation, as the fan driven by the steam-engine.

Attempts to use the heated shaft have been frequently made by persons, who knew nothing about the principle of ventilation, and, of course, have very commonly failed to produce the effect contemplated. But, because an ignorant man burns his house up, by the improper use of fire, it is scarcely probable that we shall all discard the use of fire in our houses.

There are several important errors frequently made, in the application of the heat to the shaft, and in the general application of the shaft itself, to the ventilation of the building.

I think, in the shaft, or towers, by which the Houses of Parliament are ventilated, a large proportion of the foul air is caused to pass through the fire, at the base of the tower. This requires an extravagant use of fuel. It should be burned in some furnace, or enclosure, of fire-brick, or other non-conducting substance, with a slow draught, so as to secure, first, thorough combustion, after which, it should be allowed to heat the air in the shaft, to a small degree, because while an additional temperature

of 10° , in a shaft fifty feet high, would produce a current of eight feet per second, (less the friction,) it would require a temperature of 200° , to produce a motion of thirty-six feet per second, or it would take twenty times the coal to produce between four and five times the effect.

To work economically, therefore, the flues should be large enough, to produce the desired results, with a very moderate velocity.

Another fatal error, now detrimental to many of our large public buildings, is to place the coils of steam-pipe, or other arrangements for heating, at the top, instead of the bottom, with the expectation, that the cold air will be so accommodating, as to flow up there itself, to get warmed, before being turned out of doors. Instead of which, the air from above falls in on one side, is heated, and is thus driven out on the other.

I have noticed, in many large public buildings lately erected, that attempts have been made to draw down the air, from the third and fourth stories of several detached buildings, and, from thence to conduct it, by one underground duct, to the engine chimney, at a great distance.

Such complicated and bungling arrangements, will, of course, prove failures: Because, when the wind blows hard, on one exposed building, it presses down the duct with great force, entirely overcoming the draught from portions of the building less exposed; and the foul air, from the windward side of the house and the main duct, is often pressed up into the rooms on the leeward side.

Another very common error, is to have a flue very large, in some places, but greatly throttled in others, as in the House of Refuge, in Philadelphia, where an immense ventilator was put on the roof, equal, probably, to thirty or forty feet area; and, emptying into this, were four long, horizontal shafts, made of rough boards, only one foot square each, giving an aggregate of four square feet;

but on the top of the roof, for the public to look at, was the ventilator aforesaid.

I have been informed, that this was about the manner of executing the ventilation (so called) in the new School-Houses, in Philadelphia, where they attempted to use the heated flue, and kept up a fire to create a draught.

The chimney was all right, what there was of it; but, in making the connection with the chimney between the floors, there was only the width of a single brick left out, or probably, not a tenth part of the space there should be.

Of course, all such arrangements as these, besides being a disgrace to the profession, and a great injury to the cause of ventilation, are stumbling-blocks in the way of the casual and superficial inquirer for the best system.

There are so many causes rendering one flue liable to interfere with another, unless carried the entire distance by a separate tube, that it is undesirable to extend the system of flues to a very great distance, especially in a horizontal direction; and, in practice, I seldom find any occasion for doing so. It is nearly always possible to find some corner, or space of little value, that can be spared for the purpose, at frequent intervals, throughout the building.

It is a very good plan, to place the ventilating shaft in the immediate vicinity of the water-closets. All the pipes for hot and cold water may be carried up therein, as well as the soil-pipes and, perhaps, rain-water pipes also.

They are thus very convenient for attachment and repairs, and always kept from freezing, while the building is occupied. By reference to the accompanying plans and sections, it will be seen, that it is proposed to take some of the flues from the floor of the first and second stories down to the cellar, and let them enter the heated shaft at that point. These will draw off the coldest air of the rooms; and it can, consequently, be drawn down, with the least force.

The flues from the top of the rooms, which are liable to be heated excessively

by the gas-lights, and the flues from the space immediately under the floors—which it is also proposed to have a little warmer, than the average temperature of the room—are all carried directly upwards; and enter the main shaft near the top.

It is proposed to have a coil of steam-pipes, in the horizontal air duct, over the fourth story.

Although this is heating the ventilating flues at the top, which was so strongly condemned above; yet, in this instance—as it is placed so far from the main shaft, and these flues are in the centre of the building, and mostly warmer than the rooms—it is believed, that it will be easier for the vacuum, created by the heat, to be supplied by the air flowing up these flues, than in any other way. In that case, there would be no return current.

The supply of the fresh air to this building, was a matter of much solicitude, as, from the immense amount of bituminous coal burned in Pittsburgh, indicated by the dense clouds of smoke, belching forth from its forests of factory chimneys, the whole air is filled with soot.

If a window is raised, to let in the fresh air, in a few moments every thing in the room is covered with particles of soot, some small and some not small.

It is, therefore, proposed to use a large room in the cellar, thirty-six feet square and twelve feet deep, for a settling-chamber; and allow all the air, for the whole building, to enter that way, through fine wire screens, which will catch some of the largest particles of soot floating in the air.

These screens will be so arranged, that they can be swept down, or cleaned, every morning; and probably, brushed over with oil, to assist in catching the particles of soot.

In cold weather most of the fresh air, that is required for ventilation, throughout the building, will be slightly warmed by passing over steam-pipes in the cellar.

It is not designed to *heat* this fresh air, but merely to warm it to 50° or 55°, to prevent its forming unpleasant cold currents, as it enters the rooms, and avoid too great a shock to the lungs. The additional warmth required will be supplied by direct radiation, from the steam radiators shown under the windows, and the slightly augmented heat proposed to be given to the floor by the steam-pipes under them.

This proposition of warming the floors—so as to keep the feet warm, and allow the head to be surrounded by cool, fresh, invigorating air for breathing—is believed to be of much importance.

It is so contrary, however, to the prevailing custom, which is to keep the head in an atmosphere of from 70° to 80°, while the feet are from 50° to 60°, that it may take some time to become accustomed to it, and ascertain the most desirable temperature to keep the floor at, which is probably that of 10° below the temperature of the body—say 88° or 90°—which would feel cool to the touch, and perhaps, be found most agreeable.

It will thus be seen, that great care has been taken, to study the natural movements of the air in the building, and to work *with* these currents, and never to oppose them, in any important particular.

All excessive draughts have been carefully avoided; yet, while it may be almost impossible to discover any perceptible currents of air, in any of the rooms, in passing through them, yet it will be also almost impossible to find any stagnation of the air in any parts. The heating surface is so distributed, throughout the edifice, with the excess of heat to meet the excess of cold, that, if all the doors are thrown open, over the whole building, there will be an even, uniform temperature throughout. Or, if the doors should be all shut, with fire in the ventilating stacks, the constant motion of the air will be equally well secured in that way.

SECRET DOORS TO LIBRARIES.

WE are not at all partial to any deceptions whatever, generally speaking; but, in the fitting up of large libraries, it often occurs, that proper interior display and convenience of ingress and egress—from other parts of the edifice, than those in immediate communication with the principal entrances—demand the introduction of small portals, whose coverings are mostly called secret-doors, but, occasionally, jib-doors. These are so contrived, as to present the appearance of shelves, well filled with books, and on a line, or flush, with the real shelves of the library; and they thus maintain the general effect, which otherwise would be disagreeably broken by these very convenient, but rather abrupt and unhandsome doorways.

Here scope is afforded for the most inveterate punster, the most subtle wit; and many literary celebrities have availed themselves of the tempting opportunity.

According to the distinguished British architect, Richard Brown, some very curious devices are to be met with, on a jib-door to a book-case, in the library at Killerton Park, the seat of Sir Thomas Dyke Acland, M. P., of Broad Clist, Devonshire, England. As specimens, Mr. Brown gives, from his note-book, "Playfair, on the Late Formation of Trap," "Friend's Right of Entrance," "Continuation of Chambers," "Pasquin at Home," "Treatise on the Law of Partitions," "Trap on Fictitious Entries," "Mullington on Covered Ways," "Noah's Log Book," and "Snug's the Word—By a Clerk of the Closet." The titles on the sham books, or dummies, near the hinges are equally appropriate, but even quainter, as "Squeak on Openings," "Bang on Shuttings," and "Hinge's Orations."

We offer:—"Hare on Speed," "Two Rabbits, not Welsh," "The Unexpected

Opening," "Blackstone on Quarries," "This One Deceit a Merit," "Plus Ultra," "The Guileless Imposition," "Cozening for Cousins," and "Blocks no Bar."

Garrick's sitting-room, in his residence at the Adelphi, London, had a jib-door, so contrived, as to appear, when shut, precisely like the other parts of the room, so that it was not easily found, save by those pretty well used to it. Of this, a neat little anecdote is related by Northcote, who himself had it from Garrick, when they were both, one day, in Sir Joshua Reynolds' studio, which had a similar secret door. It seems that on one occasion, a tailor came to see Garrick upon business, which being presently finished, the tailor, bowing himself away, and turning to leave the room, was utterly unable to find the door; in his comic confusion searching all around the room for the portal, which he knew had admitted him; and thus affording much amusement to Garrick, before that histrionic worthy divulged the secret, and suffered him to depart.

Brown remarks, that this kind of door always requires time and care to execute really well; and instances, as perhaps the most difficult and ingenious, as well as largest door of this sort, one at Northumberland House, in the outer court wall adjoining the Strand, and at the right hand of the general entrance-gate towards Charing-Cross. The face of the door is painted to imitate the brick wall of the house itself, with which it ranges; and so well is the whole performed, that it would be very troublesome for a stranger to find it, though the door is of immense size, being designed to admit carriages. The whole iron railing outside also moves, in mass with the door itself, whenever it is opened, which is only at stated times, for parties or routs.

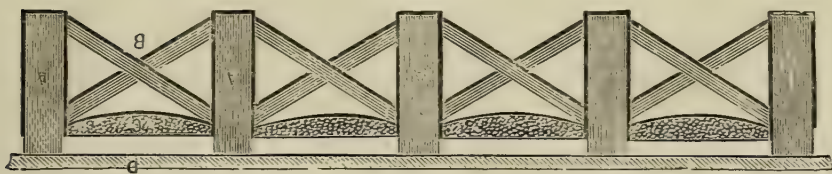


FIG. 1

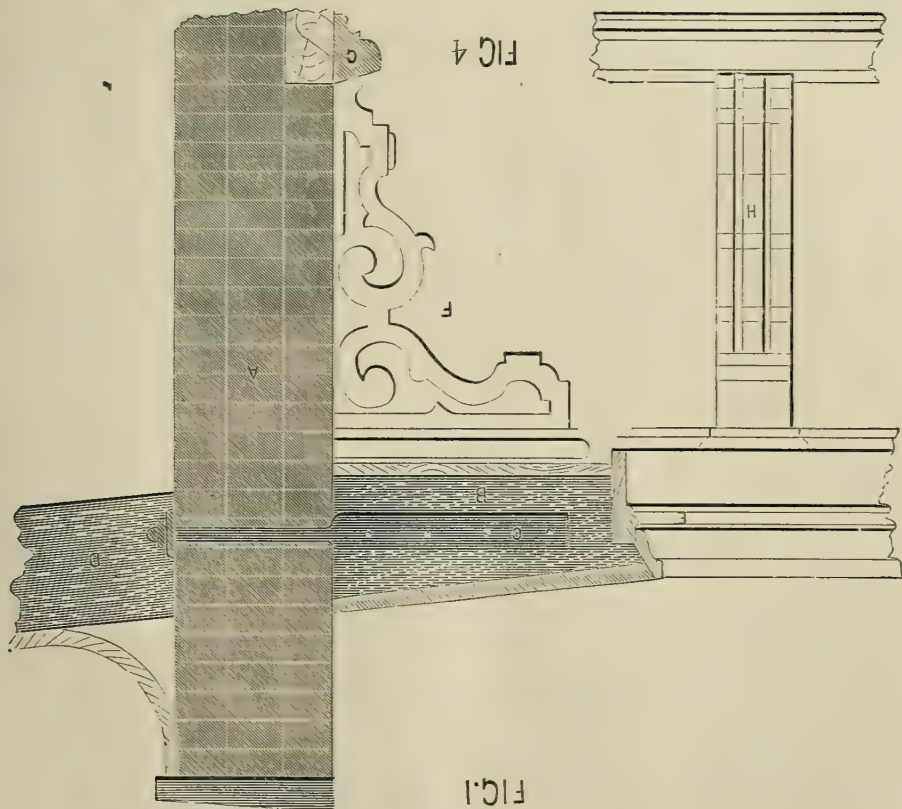


FIG. 4

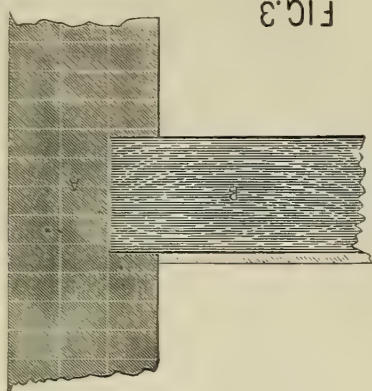


FIG. 3

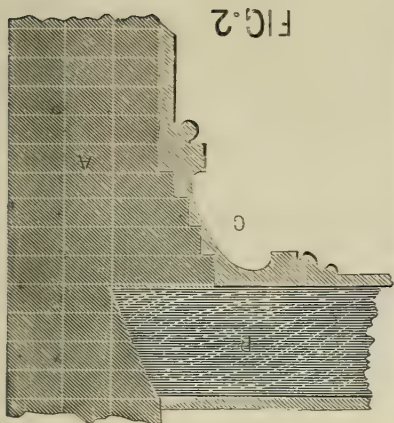


FIG. 2

MODERN BUILDING CONSIDERED:

AND SOME IMPROVEMENTS SUGGESTED.

RECENT casualties, both here and in Europe, have too distinctly shown how careless are some projectors of the management of the material with which they construct their designs. Nay, some treat the nature of the material itself with indifference. Thus, we too often see a certain poor description of brick used freely for the *hearting* of walls, as though the heart was to be the weakest part, and the thin surface, which is intended to meet the gaze of the passer-by, the best really, as well as in appearance. Stone, too, is subject to the same recklessness—shall we say, ignorance—of its actual qualities as a material in building. How often have we seen a class of stone used below ground, that was quite unfitted for such a location? For, the stone family, like the human, has its special constitution, and is subject to all the penalties of its ill-usage. There are some species of stone, which will serve a good purpose, when sheltered from the transitions of climate, or the changes of weather; others, on the contrary, will endure almost any amount of severity; whilst others again will bear moderate hardship. Some, such as *limestone*, will expand when under the influence of moisture, and some throw off latent damp when acted on by moderate heat. Some laminated stone will exfoliate when placed in a building in a position, or bed, different from that which it occupied in its native quarry. In fact, there are numerous characteristics of the stone family, which should be studied by the Architect, as well as the Builder, before any particular description of that material is chosen to occupy any certain position. There is no disguising the fact, that the great body of our professional brethren are too much in the

dark, with respect to the whole nature of the stone, they cause to be used in the walls of the building they design. But there is a still more serious defect, sometimes to be found in the professional education of architects, both here and in Europe.

We find the following item in that excellent American newspaper in Paris, *The Continental Gazette* :—

“A church in course of construction at Liniere, in Luxembourg, fell to the ground, three days back, killing one workman and seriously injuring four others. The pillars had been made too weak for the superstructure.”

There can be no doubt that the catastrophe, which is here alluded to, arose from misconstruction, which must have had its origin in want of that scientific education, which strengthens the mind of the architect, and enables him to reduce to perfect practice that design; which otherwise would be left to the chance, or the certainty, of such a misfortune as befel the church at Liniere.

Whether the construction of the roof was defective, or the pillars insufficient for the support of the required weight and pressure, it is certain that there was a defect somewhere, and that such defect, of whatever nature, the architect was accountable for.

And now we come to a subject nearer home: At a recent fire, which consumed a fine block in this city, it became evident, that the devouring element found a ready agent, to assist its progress, in the flooring timbers, which were laid within the party-walls, and thus conducted the fire-fiend to fresh conquests.

That such a system of construction is clearly mischievous, we need not waste words to prove. It is a self-evident

fact; and, although the continuous passage of timbers far into party-walls is (let us hope) very seldom to be seen, yet, that such a practice exists, the destructive conflagration alluded to very indubitably shows. But, apart from this extreme case, it is a very general practice to let flooring joists into the wall at least four inches; which being the case on both sides of a party-wall, it follows that a twelve-inch wall will thus be reduced in thickness between said joists to four inches; or the width of a single brick! When those joists are destroyed, how can such a wall stand? Even outside, or main walls, are so much weakened by the destruction of the flooring-timbers, on account of the holes left in them reducing their thickness, that they frequently totter to the ground, and in comparatively few instances is it safe to reconstruct on them. Now, there is either a necessity for extra thickness of party-walls, to meet this deduction for joist-beds; or, there is more safety in careful corbeling under the lower line of the joists; thus avoiding the practice complained of, so that the destruction of the joists would not leave the wall diminished in thickness.

As to the use of timber in flooring-joists, we propose to make it nearly unassailable by fire, at an expense not greater than that incurred in insurance policies. Nor is this a mere theory; the thing has been already accomplished in two instances in this city, once in the residence of Mr. JOSEPH HARRISON, Jr., on Eighteenth street, opposite Rittenhouse Square, and again in the Washington Buildings, on Third street, near Spruce.

The *modus operandi* is simply, as shown in Fig. 1, to encase each joist in iron, up to, say, three inches of the top, and set plates of iron between the joists reaching to the top of the bridging-course. Fill in the space between the top of the iron casing and the iron plates with concrete, or plaster of Paris which

has been used in a stereotype foundry, leaving an open space between the flooring and this concrete or plaster.

Referring to Fig. 1, A A A are the Joists. B, the Bridging. C, the Concrete. D, the Flooring.

Previously to using the iron casing on the joists in the residence alluded to, a test was made, by casing a piece of timber in sheet-iron, and submitting it to the action of a strong fire for a considerable time. The result was perfectly satisfactory. The timber, on being examined, was found to be but slightly charred.

Fig. 2 represents the Joist in its wall-hold, with the tail beveled. A, the Wall. B, the Joist. C, the Corbeling, faced with cornice.

Fig. 3, a Section of Joist in wall-hold, according to the prevailing method.

There is another improvement, which we would suggest, in reference to this liability to destruction by fire. It is, that the cornice should be made independent, as it were; simply attached to the wall and secured there; instead of being directly connected, as at present, with the rafters. Our suggestion can be at once apprehended by a glance at Fig. 4, Section and Elevation.

A, the Wall. B, the Bracket or Look-out, held by the iron-strap C, shouldered to the wall, running through, and secured on the inside with nut and washer. D, Rafter. E, Face of Cornice. F, Bracket. G, Moulding. H, Face of Bracket.

It is evident, that the burning of a wooden cornice so constructed could not communicate fire to the roof; and that there would be no further detriment to the building, than the destruction of such cornice, which, when burned, would be sure to fall to the ground, without doing injury to the wall. The blocking-course, or parapet, above this cornice, could, if thought advisable, be built so low, as not to show above the outlines of the latter. Thus, we not alone have the required appearance, but—what is better—strength and security as well.

The above article was suggested by the following letter, from an esteemed friend :

PHILADELPHIA, Feb 2d, 1868,
RITTENHOUSE SQUARE.

SAMUEL SLOAN, ESQ.,
MY DEAR SIR :

In these days, when we are all excited over the recent disastrous fires, would it not be well to consider whether our buildings cannot be made more safe than they are at present, with very little additional cost? You may remember the plan adopted in my house, and at the Washington Building, South Third street. In these instances, by casing the joints with thin sheet-iron, they were made so nearly fire-proof, that they will, I believe, at any time, resist the action of the flames sufficiently to prevent fire, of any ordinary description, burning through the floors from beneath. I think it might be advisable to illustrate this mode, in your valuable journal, as well as the method adopted at the Harrison Building, on Spring Garden street, for securing the cornice to a parapet wall, so as to prevent fire communicating to the building from the cornice. You know the test the sheet-iron-cased joist was subjected to, previous to my adopting the plan I have mentioned. If one disastrous fire is averted, by what you shall say, it will be sufficient reward for recommending this safeguard.

Yours, very truly,
JOSEPH HARRISON, Jr.

GALVANIZED TINNED-IRON.—One of the most remarkable advancements in the iron manufacture, in recent years, has been the introduction of *galvanized tinned-iron*, for an almost innumerable variety of purposes. This material consists of iron plate coated with tin, not by the ordinary tin-plate process, but by galvanic deposition. It serves as a substitute for plain iron, for tin-plate, for

zinc, and for lead, under certain special circumstances. It is stronger and more durable, for many purposes, than lead or zinc. It is better than plain iron, where rust is to be avoided. It is superior to lead and zinc in warm climates, inasmuch as it does not expand and contract to so great a degree. Within-side a house and without, in vessels and in utensils; in towns and in the country: in manufactures and in domestic economy, we now find this substance employed. We have galvanized tinned-iron, corrugated plates for roofing, and for the sides and doors of houses. In another form there are plain plates for the same purpose; roofs for sheds, roofs and sides for storehouses, and many similar purposes. Then, besides the sheet form, there are round and square bars, hoop-iron, wire, tubes and pipes, nails, rivets, bolts and screws, all formed of iron thus protected by the galvanotinning process. There is this advantage, also, which is unattainable by the ordinary tin-plate process, that articles can be tinned after they are made in the proper form of iron, provided they are of small dimensions. The plates are really a combination of three metals; for, in the first place, a layer of tin is precipitated on the iron plates, from a solution of chloride of tin, by the galvanic process; and then a layer of zinc is obtained by dipping the sheets into molten zinc.

CORRECTION.

THE WEST SPRUCE STREET BAPTIST CHURCH.—In Vol. I., No. 4, page 244, third paragraph of our description of the above edifice, it is stated, that the dressings of the wall are of "Ohio Clough Stone." It appears through letters from Messrs. Worthington & Son, Messrs. Struthers & Son, and Mr. Wm. Appleton Potter, brother of the architect, that these dressings are really from the Worthington Quarry—at Brownhelm, Ohio—which affords a very superior kind of stone.

CRYOLITE.

IN Number VII, p. 445, we gave an account of Hot-Cast Porcelain; but were unable to obtain its chemical composition, in time for the press. The omission is now supplied, in this short account of a very interesting, and, as will be seen, extremely useful mineral, called CRYOLITE, which, so far as at present known, is found, in merchantable bulk, only in a single locality, and that in the arctic regions.

Near the southwestern point of Greenland—between Julianshaab and Fredrickshaab, but nearer the latter, and a little to the northwest of Cape Desolation, in latitude $61^{\circ} 13'$ north and longitude 44° west of Greenwich, on Arksuk Fiord, or Arsut Bay—one of those deep, rocky and winding inlets, which penetrate, at intervals of a few miles, the mountain barriers of this dismal coast—is Ivigtut or Ivigtout, the point referred to, which is thus particularized, because it is not given in the Gazetteer, or upon any ordinary map. Here is a little Danish port, upon a fine open roadstead, for hyperborean regions. The neighborhood is exceedingly picturesque, the harbor being surrounded by lofty mountains, upon the flank of one of which, just behind and close to the port—so that the ore can be, and is wheeled, upon a short, circuitous, elevated, graded, wooden way, from the mouth of the mine to the deck of the ship—lies the deposit of Cryolite, a mineral whose name is also spelled Kryolite, and, by the Danes, Kryolith, the signification being *ice-stone*. The term springs from the Greek *κρύος* [*Kryos*] *frost or icy cold*, and *λίθος* [*Lithos*] *stone*. This designation arises from the mineral being, like ice, readily fusible in the flame of a candle; but as it comes from the region of perpetual frost, and in color and general appearance much resembles snow and certain forms of ice, the name is trebly

well chosen. This substance is generally, in bulk, of a very pure white, although it is found of many hues, even to a dark brown; and, while the absolutely pure specimens are of translucent white, something like pure selenite, many of the richer pieces, assaying over eighty per cent. of Cryolite, are quite dark in color.

According to James D. Dana: The primary crystalline form of Cryolite is a right rectangular prism, with cleavage perfect parallel to its ends, or, in other words, in the plan corresponding with the exact transverse section; and less so parallel to the lateral, or longitudinal, faces of the crystal. Streak white, color white, sometimes reddish or brownish, sub-transparent; translucent. Immersion in water increases its transparency. Brittle. First scientifically discovered by Giesècké, in two veins in Gneiss.

Cryolite occurs at Ivigtut, or, as it is often called, Ivigtuk, in a surface vein eighty (80) feet thick, and otherwise of indefinite extent, consisting almost entirely of pure Cryolite, the exceptional minerals, in small quantities, being the sulphurets of iron and copper, the sulphuret of lead, or "galena," crystallized carbonate of iron, or spathic iron, and a few others. Cryolite is a double fluoride of aluminium and sodium, its chemical analysis showing:

Fluorine,	.	.	.	54.
Aluminium,	.	.	.	13.
Sodium,	.	.	.	33.

100.

The mineral is found in solid masses, penetrating, on one side, the rocky ridge, at an angle of forty-five degrees, and on the other descending into the depths of the ocean. The shores of this coast are so precipitous, that vessels fastened to the land by the bow, have scarcely soundings at the

stern, the anchorage, though secure, being almost exclusively by making fast to iron rings, set in the granite rocks of the shore.

This Soda Ore, as it may popularly be called, is found in juxtaposition with granite, the rock immediately overlying the Cryolite, and forms a quarry, 600 feet in length by 200 in width, extending, from the dip of the stratum under the sea, apparently to an unfathomable depth; the blocks increasing in richness and purity, as the workmen descend, large quantities quarried at a depth of 80 to 100 feet from the surface, affording by test $99\frac{1}{2}$ per cent. of pure Cryolite; and whole cargoes containing scarcely a trace of any other mineral whatever.

This grand deposit of Cryolite was first discovered by the Esquimaux—a few years since—at the foot of a granite mountain chain, which, commencing at the water's edge, rises, almost perpendicularly, to the height of a thousand feet, and, then receding, forms a plateau, followed again by ridges and other plateaux, until an elevation of from five to ten thousand feet is attained.

The Danish Government has granted a concession of this gigantic vein, or mine, for a long term of years, to the "Kryolith Mine og Handels Selskabet," or "Cryolite Mining and Trading Society," of Copenhagen; and, through arrangement, with this company, in turn, THE PENNSYLVANIA SALT MANUFACTURING COMPANY are the distributors of this valuable mineral, for all North and South America, importing upwards of six thousand tons per annum.

By contract, the Danish Company is not allowed to ship any Cryolite of a quality below 80 per cent.; and all cargoes lost at sea are settled for, by the Pennsylvania Salt Manufacturing Company, upon that basis. Practically, by the American Company's books, the average of all the shipments is considerably above 80 per cent., the Danish Company being careful to send none below. The settlements are

made from the equation of two searching analyses of every cargo, the one by a Danish chemist—representing the Kryolith Mining and Trading Society—sent over to, and residing in, Philadelphia; and the other by the chemist of the Pennsylvania Salt Manufacturing Company, also stationed here. The last named Company is entitled, per fixed scale, to a deduction in price for every unit under an agreed per centage; and pays an additional sum for every unit above the same. This, though a somewhat protracted, is a very just method of settlement for both sides. It follows, in fact, the general mode long pursued with copper ores, guano and other products of varying quality.

As our readers may like to know how such an analysis is conducted, we would say: That a large number of pieces taken at random from the cargo, as unshipped in bulk, are coarsely ground. The product—amounting often to a number of tons—is evenly heaped, and divided into four approximately equal heaps, by a right-angled cross separation. The two diagonally opposite heaps are thrown together, ground finer, again heaped, and again divided into four nearly equal heaps, of which, this time, the two other opposite diagonals, by the points of the compass, are taken to form the third heap, which is ground still finer, and again subdivided into four, and still again two oblique quarters taken, and again heaped and again ground, and yet again separated into four, and two other diagonally opposite fourths selected, and so on; grinding finer and finer, and alternating the two fourths chosen, until the mass of impalpable powder is brought to quite a small bulk, which is then accurately divided into three equal portions, of which one is sealed up, in the presence of the agents of the parties concerned, for the use of the chemical umpire, if ultimately necessary, one is given to the analysing chemist of the party purchasing, and the remaining one to the anal-

ysing chemist of the party selling. No difference is carried to the umpire, unless the two chemists vary two-tenths of a hundredth part. If they do, the chemical umpire makes his analysis of the contents of the sealed packet; and the final analysis is equated between his result and that of the chemist for the purchaser, the process being long, but—for commercio-chemical analysis—very sure.

No Cryolite can be shipped at Ivigtut, before its cubic contents have been taken by the Danish Comptroller, and he shall have given permission.

After arriving at Philadelphia, the Cryolite is transported to Natrona, upon the Allegheny river, twenty-four miles above Pittsburgh, Pennsylvania, where a large and thriving village has sprung up, entirely owing to the extensive operations of the Pennsylvania Salt Manufacturing Company, whose grounds here comprise some forty-five acres, twenty-five acres of which are actually covered by the buildings of the Company, forming one vast laboratory.

From the time when all the soda of commerce was furnished by its simple collection from the lakes of Egypt, up through the period of its production by the burning of the sea-weeds of the coasts of Spain, France, Ireland and Scotland, there is no marked step, till the date of Le Blanc's invention of a method for its production from common salt. There are few chemical discoveries equal in importance to this. It has fostered the glass manufacturers' art, and the soap-makers' trade, and now gives employment, in England alone to 90,000 people receiving annually over \$4,000,000 in wages. It employs \$10,000,000 of capital, consuming annually 1,834,400 tons of raw material, producing 280,000 tons of finished products, with a value of \$12,500,000.

A step almost as great, as that made by Le Blanc, is the substitution, for his intricate and expensive methods, of the simple and comparatively cheap one

of utilizing the native fluoride of aluminium and sodium, or Cryolite, first proposed by Spilsbury as a source of soda.

The comparison of the two methods may be thus made:—

First. Le Blanc's method is complicated, requiring much costly "plant" or machinery, and giving rise, when extensively used, to immense quantities of hydro-chloric acid gas, as an incidental or waste product, requiring stringent enactments, with regard to its condensation, for sanitary purposes. This hydro-chloric or muriatic acid, the result of the action of oil of vitriol (Sulphuric acid) on common salt, for the production of Sulphate of Soda or "Salt Cake," constitutes the first stage in its manufacture.

Second. The calcination of Salt Cake, with Limestone and Coal-dust, for the production of "Black Ball," or "Black Ash," an impure carbonate of Soda, mixed with Lime compounds.

Third. The washing, or lixiviation, of the "Black Ash," for the separation of the soluble carbonate, and other soda salts, from the insoluble lime salts; and the evaporation of this solution to dry ness.

Fourth. The carbonating process:—that is, the conversion of any free or caustic soda—injurious to the glass manufacturer—into carbonate, which he requires.

The supplementary stages consist of the production of various conditions of carbonate of soda, and of caustic soda, for their multifarious technical manipulations.

The Cryolite process is as follows:—

First. The calcination of the Cryolite with Lime, producing alumina, soda, and fluoride of calcium, or artificial Fluor-Spar.

Second. The leaching, or lixiviation, of the calcined mass, for the separation of the insoluble fluoride of calcium from the soda, soluble itself, and dissolving also the alumina.

Third. Passing carbonic acid gas (the

waste products of combustion) through the solution, for the production of carbonate of soda, and for the precipitation of the alumina in the form of a gelatinous insoluble mass, readily separated by filtration.

The supplementary stages are the production of caustic alkali, of the bicarbonate of soda, and of soda crystals, essentially the same as in Le Blanc's process, as now worked in England.

The terms "Soda Ash," and "Soda Crystals," are by no means to be confounded. The first is applied to the anhydrous mass obtained by the evaporation, calcination and carbonating of the liquid from the lixiviation of the "Black Ball," or "Black Ash," in Le Blanc's process. It is an impure carbonate of soda, free from water, and non-crystalline. The second term, "Soda Crystals," is synonymous with "Sal Soda;" and is applied to the product obtained by dissolving the "Soda Ash" in water, and evaporating the solution to the crystallizing point. The salt thus formed contains water of crystallization, amounting to about 63 per cent. of the whole weight. *Sal Soda* is the "Washing Soda" of the shops. Bicarbonate Soda has one atom of water and one extra atom of carbonic acid, in combination with the ordinary or neutral carbonate of soda. It is obtained by exposing "Soda Crystals" to the action of carbonic acid gas. This substance is the ordinary "baking soda," or "Super-Carbonate" of the shops.

The amount of manipulation, and, therefore, the main item of the cost, is largely in favor of the Cryolite process, as well as the amount of original outlay required for the establishment of soda works. *With duty removed from Cryolite, Soda Ash can be produced in the United States at less cost, and sold to the consumer at lower rates, than the imported article.* With an onerous duty, or tariff, on Cryolite we must send to England annually for 50,000 tons of Soda, at an enhanced cost; a direct tax,

thence, is laid on at least two important manufactures, GLASS and SOAP. The fostering of the trade in Cryolite—at present the only raw material, consumed in the United States, for the manufacture of Soda—is the erection of a solid, substantial and important branch of industry—which has already done so much for English prosperity—and our release from a heavy tribute to foreign manufactures.

From the remaining alumina of the Cryolite works is now manufactured a substitute for alum, in the shape of sulphate of alumina, by which the dyer and paper manufacturer are exempted from paying for two expensive compounds—potash and ammonia—useless to them, but, hitherto, essential to the composition of alum, and to the production of an alumina salt free from *noticeable* amounts of oxide of iron. The sulphate of alumina now manufactured from the alumina residue is pure, and more valuable for technical purposes, and is sold at less cost than potash or ammonia alums. It is coming largely into use, in supplanting these expensive and troublesome salts, and has already become an article of export to European countries. *Without Cryolite, pure sulphate of alumina is a technical impossibility.*

The employment of these heretofore waste materials of the Cryolite process reduces the cost of the main article of manufacture, whilst a direct benefit is conferred on important industrial branches.

The mineral Cryolite is now also employed as a source of the metal aluminium. In France, at Amfreville, near Rouen, the Messrs. Tissier are using it with perfect success, dispensing thereby with the troublesome and costly process of a preliminary manufacture of the double chloride of aluminium and sodium—a chemical equivalent of the native double fluoride of aluminium and sodium, or Cryolite. It is also successfully used, in small quantity, in this country, for the same purpose. But it

is necessary to have Cryolite introduced into the country at a lower rate, before American manufacturers can compete with those of Europe.

The metal—practically a new and a *precious* one—is, from its lustre and whiteness, as well as from its unalterability in air, well adapted for jewelry, for mounting astronomical and surveying instruments, and for lining culinary vessels. With copper, in the proportion of 90 per cent. of this metal to 10 per cent. of aluminium, it constitutes aluminium bronze, *already an important article of import*; 100 parts copper, 70 of nickel, 5 of antimony, and 2 of aluminium, form an alloy, which, in physical properties, so much resembles silver, that it is called “minargent.” An important compound is formed by alloying silver and the new metal, in the proportion of 33 per cent. of the former to 66 of the latter. There is also an alloy, into which the metal tungsten enters, along with copper.

About one-third of the Cryolite used in this country is consumed by the Hot-Cast Porcelain Company of Philadelphia, which buys it of the Pennsylvania Salt Manufacturing Company, having purchased last year twenty-five hundred tons. The porcelain is made by melting together a mixture of sand, cryolite and oxide of zinc, both the latter in powder, so that the product is really a silicate of alumina, soda and oxide of zinc, containing, by a recent approximate analysis of Charles P. Williams, Esq., chemist of the Atlantic Quartz Company, to whom we are indebted for all the chemical points in this article:—

Silica,	70.
Soda,	13.
Oxide of Zinc,	8.5
Alumina,	8.5
	<hr/>
	100.

If the sand contains iron, manganese is added, to destroy the green color occasioned by the iron. This, of course, is to be understood of the white ware.

By the addition of various metallic oxides, this “porcelain,” or—in the language of the workmen—this “metal,” can be produced of almost every color, tint, or hue.

Though this raw material is thus the basis of the manufacture of many kinds of chemicals, all important, and all paying internal revenue duty, the United States Government, very unwisely and, indeed, unjustly, taxes Cryolite 20 per cent., through, what seems to us, an erroneous reading of the tariff, thus placing the American Company at a signal disadvantage, in comparison with the manufacturers of all other countries, whose governments admit Cryolite—a raw commodity unique in locality—duty free.

Cryolite should be free:—as it is a raw material only available for manufactures:—as it is the cheapest article from which soda can, at present, be made, in the United States:—as it is admitted duty free into England, Canada, and every other civilized country, whence its products are exported here, to compete with our manufactures:—as it gives employment to twenty or more ocean vessels, some built expressly for this trade, and all chartered by shipping houses in the United States:—as it can only be obtained through two dangerous voyages per round trip, several vessels being lost every year, thus making freights and insurance enormously high:—as it saves the export of gold, one-fourth as much gold only being required to pay for it, as would be spent for its production in soda, if imported, the rest being freight and labor paid, at home, in currency:—as it renders us independent of England for soda, that nation having to import, from Sicily, Spain and Portugal, her sulphur ore, of which more pounds are required to produce a given weight of soda, than are required of cryolite to produce the same:—as it is no monopoly of manufacture—the holders of the contract for its importation being obliged to take *many thousand tons* per

annum, and being both willing and anxious to induce others to enter into soda and other manufactures; selling cryolite to responsible parties only, and taking stock, in the new companies, for their profit:—as, with the duty on Cryolite, and the low import duties on soda, there is no profit to induce others to enter into the business:—as it is important to introduce the manufacture of Hot-Cast Porcelain—an American Invention—into general use, in this country, as also the production of Aluminium, a precious metal:—as, owing to the present method of producing most paper “stock,” or pulp, depending entirely on the facility of obtaining

cheap soda, if this country can be undersold in that commodity, we should be dependent on Europe for nearly all the paper used by the newspaper press, and much of that taken for books, a probable embarrassment likely to be much increased in the event of a conflict with Great Britain:—and, finally, as, in case of war with a maritime power, the soda manufactures of this country would, otherwise, be slow in starting; a great calamity to many interests; and, consequently, a cause of detrimental depression throughout the grand commonwealth, which should always be most strengthened, when most assailed.

PATENT METAL ROOFING.

THE kind of roofing we shall discuss upon this occasion, is that of the PATENT METAL COMPANY, of No. 114 North Sixth Street, Philadelphia. We have not been furnished with the composition in this instance; but any one, so far interested as to be specially curious, can readily be satisfied by an application to the Patent Office.

The compound itself is about the color of new type-metal, or somewhere between that of polished steel and bright tin. It is not subject to rust; and, consequently, does not require paint.

It is suitable for roofing, water-coolers, refrigerators, bath-tubs, bulkheads, spouting, water-pipe, milk-cans, and cooking vessels of all kinds.

The joints are made—and well made—by simply lapping one sheet half an inch over another, and running a soldering-iron along over the lap, with rosin, although in roofs and linings, for greater security, they are in general regularly soldered.

The hard or medallion metal, used for roofing, when thrown into the form of inch-and-a-quarter pipe, did not

break, but only opened in the seam, with a pressure of 162 pounds to the square inch. Ordinary lead service-pipe, for water, usually carries about 16 pounds to the square inch.

From its nature, of course, this metallic compound can be applied to cover any part of any building, at whatever angle, requiring effectual protection from the weather.

This metal is put on a roof in large sheets, with a simple edge roll; and unlike most metal roofs is not affected by contraction or expansion, through the severest extremes of the American climate.

The Company at first experimented, in roofing, with a soft compound of the same general appearance, but darker lustre, which—after a year's solicitude—they reluctantly found to be unsuitable; but their medallion metal has stood every test.

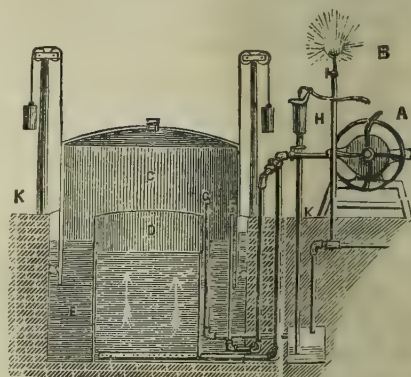
The soft metal, however, has many important qualities of its own. It is the only known substitute for Chinese sheet lead in lining chests and other utensils, designed for retaining the strength,

or fragrance of valuable commodities, such as teas, spices, &c. Indeed, for this purpose, it is superior to the sheet lead, having all its good qualities, combined with the innocuousness, in the metal itself, which cannot be claimed for lead under all conditions. The soft metal is non-corrosive, self-soldering, needs no paint, and, in thicker sheets, is eminently adapted for all linings, such as those for coal-oil vessels, water-tanks, casket-coffins, or, indeed, any vessel requiring to be air or water-tight. It is also peculiarly suited to covering damp walls before papering; and for the back wall of shelving designed for storing articles perishable from possible moisture, such as cutlery, &c. A patent paste firmly unites the different pieces of this metal, when allowed a half inch lap, into one entire solid sheet. After the thin sheets of metal are hung upon the wall with paperhanger's paste, as additional support, a few small tinned tacks are driven in the upper edge, when a little piece of the soft metal fastened with the patent paste, is covered over the head of each tack; and effectually prevents any damage to the super-dependent wall-paper. With this metal beneath the paper, no dampness can strike through.

This metal as a lining is effectual against the extreme subtlety of coal-oil; and is not affected by sulphuric acid at sixty-six degrees.

TO PREVENT PUMPS FROM FREEZING.
—A cheap and effective way of preventing pumps from freezing in winter is, to take *flax tow or rye straw*, and twist into ropes, two or three inches in diameter, and wrapping around the pump, commencing at the bottom and pressing it down tightly, until it reaches the top. By so doing, they can be kept from freezing in the coldest weather. Each part of the rope may be made about fifteen feet long.

PNEUMATIC GAS.

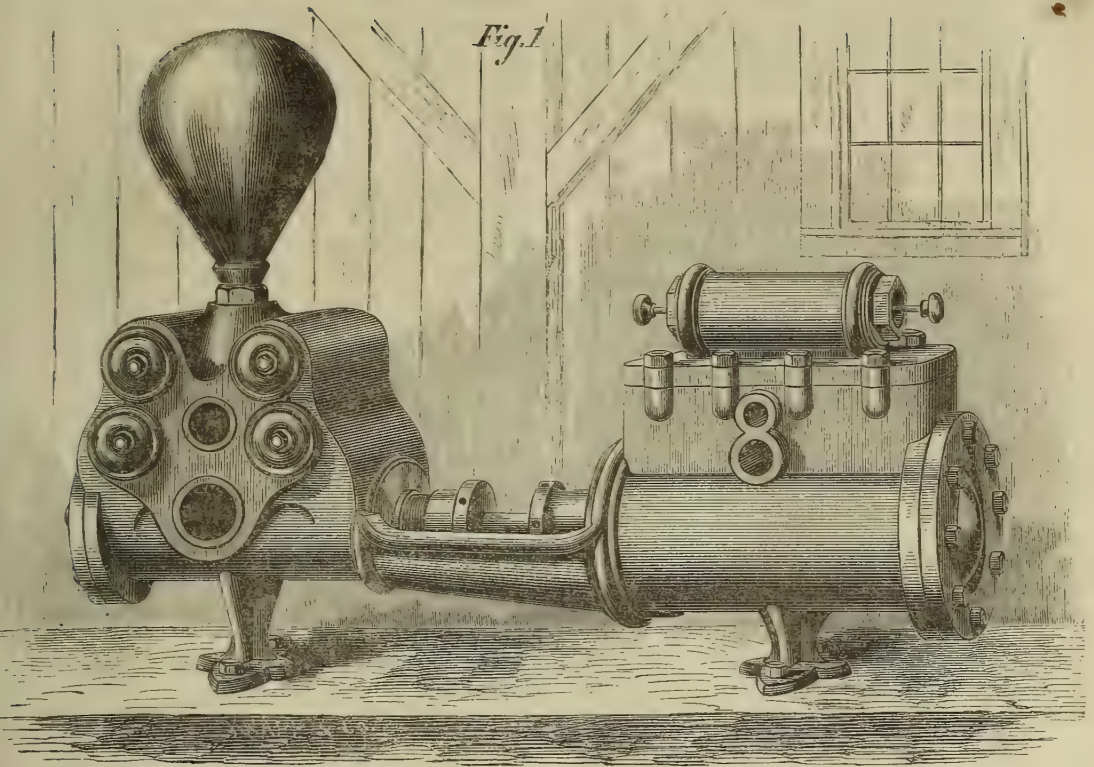


This is one of those most desirable improvements, upon former means and methods of making artificial light, which Architects feel a professional interest in. There is not a gentleman's country residence of any pretensions that does not stand in need of an illuminating gas. The difficulties, with all such offered to the consideration of the architect, are—condensation, liability to get out of order, explosiveness, and disagreeable odor.

The RAND PNEUMATIC GAS, as it is called, from the name of its discoverer, is, it appears to us, the very thing wanted. It is, in fact, what it professes to be, a practically permanent, non-condensable illuminating gas, by carbureting air with liquid hydro-carbon. The points gained by Rand's processes are so effectual as to produce a gas at once simply manufactured, excellent for all purposes, and at the same time so cheap as to give it unquestionable precedence over all its predecessors and contemporaries.

A, Air-Pump. B, Test Light. C, Gasometer. D, Hydrocarbon Tank. E, Water-Bath. F, Diluting Pipe. G, Gas Exit. H, Drip Pumps. K, Surface of the Ground.

The apparatus for the manufacture of RAND'S PNEUMATIC GAS may be seen at the store of Canby & Brother, 321 Arch street.



THE SUTHERLAND STEAM PUMP.

SOME skilful mechanics, and some able machinists, are in the habit of regarding novelties, in their special departments, with distrust; and, without much examination, treat them with indifference; or even, utter disparagement. So many changes, claiming to be improvements in machines, already performing efficient service, are presented for acceptance, with the sole purpose of making money, that we are not to be blamed for standing upon guard, and keenly scrutinizing all new-comers. But the air, which plainly says, "You can show me nothing, you can tell me nothing, that I have not seen and heard," will ever be avoided by the man, who remembers that we all work from the common stock; that we have "entered into other men's labors;" that the powers of nature are full of good-will, always impartially seeking and using

the instruments offered by human ingenuity.

May we not believe, that the Benignant Power who built and maintains the Universe, at the same time, prompts the living thought to its contrivance, and meets it with the living force, that man may not only coöperate in lightening toil, and increasing human facilities, but also have the delight of invention and discovery.

Novelties in machinery should be looked at with both an approving and an improving eye, gladly noticing any excellence; and desiring to remedy any defect, or imperfect action.

We heartily sympathize with the satisfaction felt by every true mechanic, or machinist, in possessing a machine, that does its work according to hope and wish: And, consequently, we had a special pleasure in a late visit to the

"Ripka Mills," Manayunk, the extensive establishment owned and carried on by Messrs. R. Patterson & Co. Under the guidance, and intelligent explanations, of Mr. Follensbee, Superintendent of Repairs, (the very man we should wish to have in that position, were we the fortunate proprietors,) we inspected some of the new machinery and improvements now introduced. Our attention was specially called to the "SUTHERLAND STEAM PUMP" employed to feed the steam boilers with water, by forcing it in, against the head of steam. To those acquainted with the numerous inventions in this direction, of which, perhaps, the best known, and most extensively used, is the "Worthington Pump," improvement may seem hopeless, and any claim to have accomplished it, presumptuous. One needs, however, in order to be convinced, only to see that little No. 2—next to the smallest size—working steadily, and noiselessly supplying the four large boilers—and able, as Mr. Follensbee assured us, to supply four more—obedient to the touch of the engineer's finger, and making its ten or twenty strokes per minute, or two hundred, as required. The observer wonders how the valve on the upper side of the steam-cylinder is moved. He sees no familiar upright arm, fixed upon the piston-rod half way between the steam and water cylinders, and carried, sliding along the valve-rod, back and forth with the piston. He hears no click! clack! as it hits the tappet, or nut, making, at high speed, a perfect clatter; and he is told, that here was just the opportunity for improvement. Steam alone, acting directly, is made to do the work, without the aid of tappet-arms, eccentrics, or any of the complicated contrivances, heretofore considered essential; which quickly wear out, and render a pump useless, causing trouble and expense. The main valve is operated by steam, let on by secondary valves, which, themselves, are operated by the main piston—being lifted

alternately, as it approaches the end of its stroke—and thus allowing steam to pass into the valve-chest, move the main valve, and reverse the motion of the piston. The small valves are very nearly balanced, by the pressure above and below; just sufficient difference being allowed, between the diameter of the stem, and the diameter of the valve, to make the pressure on the top of the valve slightly greater than that below, so as to keep the valve on its seat, till, started by the movement of the piston, the current of steam immediately carries it up; so that there is no wear, between the hardened surface of the piston, and the end of the valve-stem. These cunning little valves, too, admit live steam, upon one end of the main valve, and, at the same instant, exhaust from the other end, thus insuring positive, true and certain motion. One important feature of the steam-valve is, that it compensates for its own wear; and having its main exhaust-port always open, all trouble from leakage is obviated.

These points we learned from our obliging conductor, and from an article in the "Scientific American," shown to us. The advantages claimed for this Steam-Pump are numerous and make quite an array, when summed up. Perfect surety of operation; always starting readily; no dead points; great durability; extreme compactness; from twenty to fifty per cent. heavier than other steam-pumps; no expensive skill required to operate it; small number of parts; pumps water—at all temperatures, even to boiling—and all other liquids, for which steam-pumps are used; has great power, steadiness of motion, and velocity combined with freedom from all unnecessary friction.

It is especially effective, as a stationary FIRE-PUMP. Mr. Fritz, the accomplished Superintendent of the Bethlehem Iron Works, has, we understand, taken a No. 7, for this special use. Other first-class engineers in the Valley of the

Lehigh, and different parts of our own and other States, have adopted and recommend it, as unqualifiedly as Mr. Follensbee.

We have mentioned the stillness with which the one at "Ripka Mills" does its work. A gentleman the other day, in our hearing, spoke of the annoyance suffered, in one of our finest hospitals, from the rattling of the steam-pump, used to force water to the different wards and apartments, and we thought that, perhaps, the most agreeable of the advantages attained by the Sutherland Steam-Pump, is its quietness; for it can be used, in public institutions, or private dwellings, without disturbing any of the inmates.

So far, we have spoken only of the Engine, because the chief specialty is found in its construction; but the Pump part, also, is characterized by an ingenious and efficient arrangement. It is double-acting; and has two hinge-valves, communicating with the suction-pipe; and two similar valves, communicating with the delivery-pipe. These valves are hung singly, or in pairs, or all together, in a plug, or cylinder, which is inserted in an opening, made for the purpose, and fastened there. Thus the valve may readily be removed and examined.

The accompanying perspective view, while it shows the compactness of the machine, will not enable any, but an experienced eye, to trace the internal construction, from the description we have given; and we regret, that we cannot give a vertical section, by means of which any person could follow the course of the steam through its ports and passages, so admirably and yet so simply adjusted, one can hardly help thinking, that the expansive creature, as it rushes along, must rejoice at the ingenuity, which allows it to do so much work, with such celerity and certainty.

This Pump is already in extensive use; and the manufacturers warrant all sizes. It was patented, in the United

States, August 14th, 1866. Re-issued March 26th, 1867, and February 18th, 1868. Patented in England, October 8th, 1868.

The agents are Messrs. GREGORY & STEWART, No. 447 North Broad Street, Philadelphia.

GLASS MOSAICS.—The production of glass mosaics requires unwearied patience, combined with much skill and taste. In the first place, the materials of glass are mixed with various coloring substances, chiefly metallic oxides, so as to form opaque colored enamels; these enamels are cast into slabs, or flat cakes; and the slabs are cut into very small cubes, or rectangular pieces. Not only is every color imitated, but every gradation of tint in each color; insomuch, that, at the great mosaic establishment at Rome, maintained by the Papal government, they have no less than *thirty thousand* different tints of colored enamels, all classified and registered. With these little colored cubes, a picture is built up, copying some celebrated work of the Italian or other masters. The pieces are inserted, one by one, in a bed of cement, which dries to extreme hardness. Each piece is ground, at a kind of lathe, to the exact shape required by the particular tint in each part of the picture; and when the picture is completed, by this extremely slow process, the surface is ground down and polished. Views of St. Peter's, the Colosseum at Rome, the Roman Forum, the Temple of Pæstum, the Harbor of Genoa, the Bay of Naples, &c., were in the Italian compartment of the Great Exhibition. The minutest touches, the most delicate tints, were imitated, and in some instances with surprising success. It must be remembered, too, that these colors are not mere surface tints, not merely "skin deep." They permeate the substance of the glass, each little fragment having the same tint all through its thickness.

CONSERVATORIES.

OF all the appendages to modern residences, which owe their origin to the increasing refinement and civilization of the times, there are none, which so markedly indicate the possession of ease and elegance, as those which form the subject of this brief notice. They not only afford a useful and agreeable means of healthful exercise and recreation, during inclement weather, but contribute greatly to form a striking architectural feature, in the general appearance and design of a dwelling. We would wish to see them still more generally adopted, than they are at present; and there is no very cogent reason why they should not be; nor why the size of the Conservatory should be regulated by the size of the house. A cottage might just as well have a large Conservatory as a small one; because, after the cost of the first construction, and fitting up, the subsequent expense of the maintenance is about equal, whether it be large or small.

Besides, a Conservatory properly being intended for the growth of trees and shrubs, and not for mere plants in pots, a sufficiency of room must be given for these to expand themselves; otherwise they will become puny in their growth, and blanched in their appearance.

There has been much controversy, as to the distinction between a Greenhouse and a Conservatory; and they have been so much confounded and misapplied, that it is a difficult matter, to define what is properly a Conservatory. The general meaning of the word may now, however, be taken to signify a structure, which differs from a greenhouse, in so far that, in the latter, the plants and shrubs stand in pots, which are placed upon stages; whereas, in the former, the plants and trees are regularly set, in beds of the finest composts, into which they are removed from the pots

and tubs taken out of the greenhouse. The general style of construction is similar in both; but, as a necessary consequence, in order to give the shrubs and trees abundance of room to attain a full growth, Conservatories must be more spacious and elevated; and are generally finished in a much superior style to greenhouses.

The best aspect for any building, in which it is designed to keep plants, is in general the south, or any point between S.S.E. and S.S.W., in order that the advantage of the heat, gained by the rays of the sun, during winter and spring, may be preserved. Nevertheless, whenever this heat, so necessary to the vitality of the plants, can be obtained by artificial means, the aspect is a subject of very little importance; and the glass may face any point, so long as it is not shaded by some other building, and the ventilation is not impeded, or interfered with.

As regards the dimensions, there can be no arbitrary rule. The height should never be less, than that of the apartments with which it is connected; and, as a general rule, the width should be one and a half times the height.

The mode of heating Conservatories is, usually, either by smoke-flues, or by tubes of hot water, or steam, carried under the paths; or, where there are stands, these tubes can be run through underneath them. In whatever manner the heating is carried out, the greatest care should be taken to have the method adopted altogether concealed, as nothing detracts more from the appearance and the appropriateness of a structure like a Conservatory—designed as much for ornament as use—than to have the tubes, by which it is heated, forming conspicuous objects of view.

The architectural style of Conservatories must, as a matter of taste and

uniformity, be governed by that of the dwelling to which they are to be attached.

The materials, of which they are constructed, are either wood or iron; and the comparative merits of both of these have been the subject of much diversity of opinion, among men of experience and practice. Especially in the use of iron for the roof, there is admitted to be great risk of the expansion and contraction of the metal, from the extremes of our climate causing apertures between the rafters and lights, admitting the external air, and, of course, adding to the cost and difficulty of properly heating. Notwithstanding, however, this and other objections, such as, for instance, that an iron-roofed structure

is much more difficult to warm, than a wooden one, the great convenience of iron, and the extreme lightness and elegance it imparts to the construction, will always give it a signal advantage over wood.

Conservatories, on a large scale, are becoming more and more popular, each year, amongst our wealthier citizens; and we know some of considerable pretensions; but we have not reached the magnificent proportions, in such structures, to be found in Europe. However, we are yet young; and our hope ardent; so that, with the laudable ambition of our nation, there is a prospect of future magnificence rising before us, which it is our duty to cherish to the utmost.

STAINED GLASS.

FROM THE OLD AUTHORITIES.

No. 2.

THE MATERIALS.

IN a preceding number, we gave, for reasons therein explained, the History and General Method of the Earliest Processes in Stained Glass. We now set forth a Detail of the Modes of the Stained Glass Artist-Chemists of the Middle Ages. Doubtless, present artists in glass will smile at some of the sagely enforced prescriptions exposed below; but, still, as these emanate from a portion of the old literature of the subject, which, perchance, they may not have read, they might be interested in the groping steps and darkling progress of their earnest brethren of the olden time. If we are not greatly mistaken, the celebrated Leonardo da Vinci constantly used some human being, as a model for his creations of fancy, often depicting the face of a lovely young woman from the time-scarred features of an ugly old man. Following this practice, of taking

models for deviation, even this buried rubbish-lore of the art may give an important hint to the modern artist in glass.

THE MATERIALS.

The Materials necessary for coloring glass are the sparks or scales of iron, which fall from the anvils of blacksmiths when they forge; white sand, or silicious earth, or, what when comminuted are the same, the little flints of a clear river; red lead; saltpetre; rocaïlle—a name for the little, round, green and yellow grains, sold by the tradesmen; silver; harderic, or Spanish iron ore—artificially produced with filings of iron and sulphur, stratified in a covered crucible, then to be taken out, and put into the fire for five or six hours;—manganese, saffre, or zaffre—a gray mineral earth, which colors glass and gives a blue color, fit for enamel, the name arising from the fact that it gives the color of the sap-

phire;—red ochre; gyp, or transparent, plaster-like talc; and litharge of silver.

All these colors are to be ground separately, upon a piece of copper a little hollowed, or in the bottom of a basin, with the water, in which gum-Arabic has been dissolved.

To produce *black*, some scales of iron must be well ground, for two or three hours, or more, on the plate of copper, with one-third part of *rocaille*, and then be put into some vessel to be preserved. As soon as it becomes red in the fire, it is a good method to put into it a small quantity of soot, grinding this with it; or copper burnt, mixed with the sparks of iron, is better, for the soot has no body.

For *white*, silicious earth must be heated red-hot in a crucible; and then be poured out into common water to calcine it, and afterwards be reduced to powder. It must then be pounded in a marble mortar, with a pestle of the same, and be ground again upon a marble slab. One-fourth part of saltpetre is then mixed with it, and the whole is calcined. It is then pounded again and once more calcined in a quick fire, as before; and taken out of the crucible for preservation. When used, an equal quantity of plaster or gyp must be added to it, which must be separately baked, and as much *rocaille*; and the whole must be ground together on the plate of copper.

To make *yellow*, silver must be put, in small pieces, to bake in the crucible, mixed with sulphur or saltpetre. When it is entirely heated, and taken out of the fire, it is to be emptied into a vessel of water. It is then to be pounded in a marble mortar, till it becomes fit to be ground on a porphyry stone, which it will be in the course of half a day, moistening it with water when it shall become dry. When ground it must be mixed with nine times as much red ochre, and the whole ground together for an hour. To obtain *red*, litharge of silver must be used; scales of iron and gum-Arabic,

each the weight of an escu, or French crown-piece; harderic, or iron ore, half an escu; *rocaille*, three ounces and a half; sanguine—described by Felibien, as a red stone, of which crayons for drawings are made, therefore, probably red chalk—three ounces. The *rocaille*, the scales of iron, the litharge, and the harderic are to be ground together, for a full half hour, on the plate of copper. After this the sanguine is to be pounded very small in a thoroughly clean iron mortar, and then put aside. Next, the gum-arabic is to be ground in the same mortar, in order that it may extract what remains of the sanguine; for it is necessary that the gum should be so dry, that it may easily be reduced to powder. When thus pounded, the gum and sanguine are to be mixed, and turned out upon the plate of copper, where the other drugs already are, and the whole ground together as quickly as possible; for the sanguine wastes itself in grinding too much this time. Care must also be taken to keep the whole soft, and of the same consistence as other colors; neither so moist that it will run, nor so hard that it cannot be tempered with the finger. It is, however, much better that it should be a little hard than too soft. This composition being placed upon the plate, must be put into a glass pointed at the bottom, which is of great importance, and it must then be poured into a little clear water. In the next place, this substance is to be tempered with the end of the finger, as much as possible, a small quantity of water being again added to it, and be made of the same consistence, or a little more liquid, as a stale yolk of egg. Thus tempered, it ought to be covered with a paper to secure it from the dust, and must be suffered to rest for three days and three nights, without being moved. Afterwards, the purest part of the color, which swims at top, must be poured off into another vessel of glass, care being taken not to shake any part. This

color, being thus put away, must be permitted to rest two days more, after which it is to be poured out, as at first.

This last color is to be placed upon a piece of glass a little hollowed; and the whole, laid on some sand in a common earthen vessel, is to be set on the fire to dry slowly, and to preserve it. When it is intended to be used, a drop of clear water is to be poured on a piece of glass, with which as much color, as is necessary, is to be tempered. This color serves for the carnations; for, as to that which is the thickest, and remains at the bottom of the glass, it is only fit to make some tints for wood and draperies.

Green is produced from *æs ustum*, or copper burnt, one ounce; white sand, or silicious earth, four ounces; and red lead, one ounce. The whole, after being ground together in a mortar of bronze, is to be put into a fire of live coal in a covered crucible for about an hour, and then taken out. When cool it is to be ground dry in the same mortar; and then, adding to it one-fourth part of saltpetre, it is to be again placed in the fire, in the same crucible, for two hours. It is next to be taken out and ground, as before; and adding to it again a sixth part of saltpetre, it is to be replaced in the fire for the third time, and to be left for two hours and a half, or thereabouts. After this, the color, hot as it is, is to be taken out of the crucible with an iron instrument; for it is tenacious, and difficult to get out. It is a good method to lute the crucibles, because few are found sufficiently strong to resist the force of the fire necessary for these calcinations.

Blue, purple, and violet are produced in the same manner as green, only changing the scales of copper for other materials; as, for instance, to make *blue*, we must take zaffre; for *purple*, we need manganese; and for *violet* we require zaffre and manganese in equal proportions. The other materials, in each of

these cases, must be the same, as in the case of *green*.

Yellow rocaille demands three ounces of red lead and one ounce of sand, or silicious earth, which must be calcined, as has been said.

For *green* rocaille only one ounce of red lead and three ounces of sand are necessary.

The tints proper for *carnations* are made with harderic, or iron ore, and as much rocaille: after having pounded them together, they are to be ground on the basin.

The color for hair, for trunks of trees, and other things of a like kind, is produced from harderic and scales of iron, an equal quantity, and of rocaille as much as of both the others. The whole is to be ground together, and this will make a *yellowish red*.

So far our old authority, to whom we shall shortly recur.

STAINED GLASS is so well adapted to the pre-entation of heraldic subjects, that, in its gorgeous transparency, we should be glad to see blazoned the entire range of arms belonging to the United States, in some grand and spacious hall consecrated to patriotic use. In the great window at one end should appear the National Arms, in that at the other, in an upper compartment, the National Flag; in a lower compartment the Arms of Pennsylvania, as possessing Independence Hall, the Birthplace of the Nation. Six large windows on each side, should be occupied with the arms of the other twelve original States, and those of the admitted States should be well and amply provided for in other piercings of the walls. As badges, the National Shield, the American Eagle, the Olive Branch, the Arrows, the Stars, the Revenue Flag, the Union Jack, and sundry variations of the Shield could be introduced very appropriately. Well managed, it is impossible to conceive a finer effect than this would have upon the patriotic mind.

THE CITY OF THE DEAD.

POMPEII, the buried city, whose remains are turned up, two thousand years after being overwhelmed by burning lava from Mount Vesuvius, is situated in the Neapolitan territory. It is less than two miles in circumference; and in this narrow compass of its walls, are to be found all of luxury, that man, in his most ambitious mood, can look for. Stores of glittering showiness, dwellings of luxuriant affluence, and public buildings, that in their architecture are superb, even in our day of splendid revivals.

Although this gaudy little city belonged, at its destruction, to the Roman Empire, yet was it eminently Grecian in its origin, and its style of architecture. The figures painted on its buildings are all dressed in the Greek *pallium*: the Roman *toga* is never seen. The order of their peristyles is the Greek Doric, so very different from the Roman model of that order. The many terraces are invariably Greek, in their design, as are the saloons, theatre, forum, circus, and the palaces. All of these are *petite* in scale, but exquisite in taste.

In the suburbs of Pompeii are to be seen the remains of villas, of which that of Diomedes is far the finest. From the examples here left to us, we may learn the amount of splendor in which the citizens of Pompeii lived; and estimate, at the same time, by a contrast with our own style, the comforts, or discomforts, which were theirs.

The want of glass left their gorgeously-furnished chambers in darkness; and the absence of all ideas of chimneys compelled them to use the comfortless brazier, with its sickening fumes of burning charcoal.

In their domestic life, then, the Pompeians had not, with all their wealth and magnificence, the real luxuries, which we of this age of the world enjoy.

The villa of Diomedes, to which we have alluded, may be taken as a sample, being the finest of the suburban residences of Pompeii, having three stories; whereas most of the other houses had only one. It shows the double life of those easy people, which was at once public and private. The public part is composed of the vestibule, and the *atrium*, which comprehended, nearly always in the same order, the court, the audience-room, the wings, and the corridors. The private part contained the bed-rooms, the dining-room, the sitting-rooms, the picture-gallery, the library, the baths, the parlor, and the court, set out with flowers and shrubs. All these apartments were ranged round the peristyle. Most of the small rooms, for private use, received no light, but from over the door; had no fire-places; and were very far from being comfortable.

It is evident, from the inconvenience of these rooms, that the life of the inhabitants of Pompeii was chiefly out of doors, and public; and, that, except at night and their principal meals, which were towards the evening, they passed nearly all their time at the Forum, or under the porticoes. The *atrium*, even of the house, was a kind of inner forum, in which they received their great friends and their dependents; and where they continued to live in the open air. The home of the English, the ingle of the Scotch, the *coin du feu* of the French, or the fireside of the Americans, was totally unknown to them.

In almost every house, there is some difference, in detail, from the rest; but the principal outline of the plan is the same in all. In every one, you find the hall, the tablinum, and the peristyle, communicating with each other. In all you find the walls richly painted, and with all the evidence of a people fond of the refining elegance of life.

The purity of taste of the Pompeians in decoration, is, however, questionable. They were fond of the gaudiest colors, and fantastic designs. They often painted half of their columns a bright red, leaving the rest uncolored.

The apartments appropriated to sleep were generally so diminutive, that few, who have not seen their bed-chambers, even in the gayest mansions, can form any notion of the petty pigeon-holes—resembling nothing modern so much as the contracted bed-rooms of ocean-beach hotels—in which the citizens of Pompeii evidently thought it desirable to pass the night. The bed, in fact, with the ancients, was not that grave, serious, and important part of domestic mysteries, which it is with us. The couch itself was like a very narrow and small sofa, light enough to be transported easily, by the occupant himself. “Take up thy bed and walk,” was, as Sir William Gell observes, no metaphorical ex-

pression. By the patile vases, found in their tombs, we are informed, that they had dinner-beds, of the earliest Asiatic fashion; tables of citron wood, delicately inlaid, and cærulean chairs, which Livy says were afterwards introduced into Rome.

They had flower-gardens attached to their houses; and where the latter were small, the walls were frequently tinted, to deceive the eye as to their extent, imitating trees, birds, temples, &c., in perspective; a monstrous delusion, which the graceful pedantry of Pliny himself adopted, with a complacent pride in its ingenuity; although, in this, he only paraded and praised a falsehood.

The Pompeians, like the Genoese, had terrace-gardens on some of their houses. Such was that lively and luxurious city of the living—two thousand years ago—which, by a dire catastrophe, has been transformed into THE CITY OF THE DEAD.

ORNAMENTATION

FOR LOOKING-GLASS AND PICTURE FRAMES.

THE progress of art and science within the last quarter of a century is, perhaps, more marked than at any other period of the world's history. In their application to manifold utilitarian purposes, we question whether they have bestowed more real benefits upon mankind, than those developed by their association with the various branches of mechanism. And when we add to these agencies a new-born genius for invention, it is not surprising that the Patent Office is overburdened with business. The multiplicity of patents, accumulating each year, attests the rapid advance we are making in those facilities which lighten the burden of labor, and contribute largely to the wealth of the country. Machinery, at first imperfect, and managed with difficulty, has been so improved as to meet the highest

expectations of the inventor; opening a wider field for capital, and extending the area of industry to the last footprint of civilization.

In all mechanical branches, a most radical change has been effected. There is scarcely an occupation pursued, in which the operative produces the same article by the same process adopted a few years since. Old men will tell you, that the most finished workman of the present day, would have proved wholly incompetent at one time to follow his occupation, and effect like results, with the implements then in use. We need only visit any workshop or manufactory to verify these remarks. For instance, how would it be possible to satisfy the cravings for mental food, did society depend upon the old process for printing books and newspapers? And if we

come down to the simple article of matches, housekeepers would still have recourse to the old tinder-box, with flint and steel, were it not for the rapid advances we have made, and the cultivation of those intellectual attainments which project and perfect improvements in tools and machinery.

We must admit, however, that while art and science have taken by the hand, and led forward, almost every branch of mechanism, that of ORNAMENTATION was long neglected, and left to pursue the old beaten track, far in the rear of others. And yet, no more useful—no more necessary—convenience pertains to home comfort. From the building of Solomon's Temple, to the present time, ornamentation has been inseparable from every ancient or modern structure of note. The humblest cot, the proudest mansion, the largest hall, are alike incomplete without its aid. To the critical eye, a bird without feathers, an animal without hair, or a man without apparel, would be no more repulsive, than a house destitute of ornaments, or those pleasing reliefs executed by the carver's handiwork.

Within the last twenty years, much more attention has been paid to this art than formerly. The many new styles of architecture, and the great competition has brought out a proportionate number of new ornamental patterns. Architects have, of late, given more attention to the *effect* they produce, and have become more earnest in their efforts to establish a harmony in their application. A correct taste is as essential in this department, as that required to finish a lady's toilette. There is a certain standard of grace and beauty to be attained with one as well as with the other.

One great improvement in ornamentation, may be attributed to the Daguerrean and the photographic arts. It is needless to say, that looking-glass and picture-frames are an important branch of the carving business. The various

devices required by popular taste for these ornaments, created an extensive demand, and the improvements leading to increased facilities for taking "sun-pictures" of the "human face divine," of all sizes, increased that demand. Again, the inventive genius of the age was taxed to meet it, and not in vain. The superior style and finish of every description of moulding is apparent to every observer. This has been brought about by the introduction of machinery adapted to the purpose, without which, it would be almost impossible to satisfy the wants of the public. In fact, the absence of these facilities would, ere this, have placed these luxuries (for such we consider them) beyond the reach of all persons of moderate means; but now their cheapness renders them accessible to all.

A short history of the rise and progress of Ornamentation, and how it obtained its present perfection, may not be uninteresting to the readers of THE ARCHITECTURAL REVIEW AND AMERICAN BUILDERS' JOURNAL—the writer naturally supposing, that the patrons of that periodical take an equal interest, with himself, in all that develops the intellectual and material resources of the country.

Up to 1848, it was the custom to have workshops in the rear of looking-glass and picture-frame stores; where mouldings were worked out of the pine lumber by hand; using a plane and a few other tools. This was a distinct mechanical branch, which gave employment to quite a large number of workmen; and apprentices were regularly indentured to learn the trade. The frames and moulding were whitened by hand; and the preparation for gilding was considered quite a difficult task. It was necessary to apply several coats of this preparation to get a sufficient body to resist the burnishing, and to prevent its having a damaging effect on the gold-leaf. Pumice-stone, of reversed shape to the members, was used to

smooth the coating; and then scrapers, of reversed shape, of wood or iron, were used to remove the sediment made by the pumice-stone. The moulding was then dried, and pumice-stone again applied, with water, to make a still smoother surface. After this it was rubbed down with cotton or linen rags, saturated in water, and fine sand-paper applied to it.

It follows, of course, that in proportion to the number of fine members on the moulding; greater difficulty was experienced in making a proper finish. Some of them were worked out by moulding-planes; and, in those of large size, it required two hands to work those planes. The whole operation necessary to complete the article was slow and tedious; and required a care and precision, the least variation from which, would surely result in a "spoiled job."

About the year 1849, a machine was invented and constructed, which was designed to supersede a great portion of handwork. It was a carriage, to which the moulding was fastened, and reciprocated—the planes holding fast the moulding in perpendicular action. This improvement proved to be a saving of about 75 per cent. over the old hand process. The inventor was thus enabled to supply the trade at cheaper rates than they could possibly be made; and, in the course of two or three years, he built up an extensive business, because he was the first, and only one to sell fine picture and glass frame mouldings at much reduced rates.

Soon after this, another machine, known as the Woodworth Rotary Plane, which had been used a number of years for planing flooring-boards only, was so improved as to be adapted to working out mouldings. On this, 4,000 feet of moulding could be executed, in the same space of time that 150 feet could be finished by hand. This invention was so successful, that it soon came into general use, and entirely abolished all

hand-work, as far as fine work was concerned. This new facility naturally disturbed the existing relations between employers and journeymen; and left the latter, for a time, without work; but many of them commenced business for themselves, by procuring the pine mouldings from the factories, and finishing the work; thus saving much labor, and the various costly planes, required to work out the different patterns then in use. This new turn of affairs allayed the wide-spread panic among the journeymen; who now regarded what they at one time esteemed a misfortune, a blessing in disguise.

But, too soon for them, they were destined to be jostled from this condition of content by another improvement for finishing the work. In 1851, a machine was invented for enameling mouldings, which produced a most sudden and complete revolution in the manufacture of picture and looking-glass frames. The importance of this invention can scarcely be estimated. It required well-skilled labor, by hand, to accomplish, with the closest application, but a mere fractional part of what this machine could finish in the same space of time. With this new facility a green hand, in the course of a few months, could execute a wider range of patterns, and of far superior finish. In fact, it could turn out a greater variety of work, with a neatness of execution that could not be approached by hand.

The latter machine became more widely known to the trade during the years 1855-6; and its power and adaptation to the business produced a profound sensation. Capitalists, without the remotest knowledge of mechanism—certainly wholly ignorant of this branch of it—at once invested their capital, and started large establishments; while those who had devoted a life-long servitude to the calling, and who were unable to procure the means to purchase a machine, were forced to abandon it. Journeymen, who had prospered, and

were steadily employed under the old order of things, were driven to other channels of labor. We may say, that this sudden change brought upon the latter many privations, and caused no little suffering, because it effectually deprived them of employment, until opportunity opened up other pursuits. These are calamities, however, following the introduction of almost all machinery; but time eventually establishes an equilibrium, and all share, to a greater or less extent, the benefit of such improvements.

As the merits of this invention became appreciated, and its efficiency established beyond all cavil, no little excitement was created throughout the country. Large factories were established in the principal cities for the purpose of supplying dealers with moulding and frames. Steam-power was applied to the machines, and the article was furnished at a still greater reduction in price, while new styles and varieties of patterns were constantly multiplying. This reduction created a demand from a large portion of the population, whose limited means heretofore prevented them from patronizing dealers in these articles. Now, however, they were placed within the reach of all, and it is not surprising that the manufactories were driven to their utmost capacity, nor that new establishments should spring up in every direction.

With this increase, came a demand for various styles of crooked work, such as oval, elliptic, and arch-top frames. The science and skill of the trade became centred in efforts to reach a higher degree of perfection, and each year brought its improvements in machinery, as well as in new styles and patterns of work.

From 1850 to 1860, a number of patents were issued for new inventions, with the view of adding still greater facilities to those already in existence. Some of these were taken out in other countries; and, up to the present period,

manufacturers are striving to excel each other by experimenting and inventing with the hope of surpassing all former efforts. And yet, in view of the present most complete process, it seems almost impossible that it should be excelled. When we reflect that a frame which cost in 1850 five dollars, can now be purchased for forty cents, one would suppose that ambition and enterprise in this business had found its limit.

Up to 1855, large quantities of moulding, and other picture-frame work, were imported from abroad, because of the cheapness of foreign labor. This, for a time, caused quite a depletion of the home trade; but when the inventions we have alluded to were introduced, the reaction was so complete, as to wholly shut out foreign competition. In 1860, the American manufacturers commenced sending goods, in considerable quantities, back to their former competitors; and, from that time to this, we have continued to supply them to some extent. The exportation to Europe of mouldings and frame work, now constitutes an important trade item.

To counteract this dependence upon American manufactures, a number of foreign dealers came to this country and purchased some of our patents for the necessary machinery to manufacture it there. This has not, however, lessened the foreign demand; for the reduction which followed improved machinery, has placed the article within the reach of the European masses as it did of those in this country. Indeed, the demand at home and abroad keeps pace with the increased facilities for manufacturing; and it is reasonable to suppose that public taste will not suffer the least abatement for many years to come, if ever.

We regard the science of ornamentation as practical in its uses, and as permanent in purpose, as any other that gives comfort or lends refinement to our race, and contributes no little to the social elevation of society. It combines

utility with luxury; gives grace and harmony to the household, opens a broad channel of enterprise, and adds largely to the industrial interests of the country. The architect, the builder, the cabinet-maker, the upholsterer, and every housekeeper in the land, will agree with us, that it is also an evidence of the progress of civilization; for it shows the rapid advance we have made in all that adorns and beautifies.

It is to be regretted, that these ornaments, which give such a splendid finish to the exterior and interior of buildings, are used too sparingly, and that such as are used, are not always properly adjusted, or tastefully applied. To the critical eye, the present mode of furnishing costly dwellings is much at fault. But little or no attention is paid to the appearance or style of the furniture. Particularly is this the case with parlors containing large and costly mirrors, portraits, or choice pictures. The frames are seldom proportioned to the size, and too often lack the necessary ornaments to harmonize with the furniture or the finish of the room. A certain degree of *consistency* in the apportionment of ornaments on frames is necessary to produce a proper effect, and present an imposing appearance. All this can be attained, without excess of display, or detracting from the symmetrical richness and gorgeousness of the whole.

In regard to looking-glass frames, especially, there seems to be a defect of judgment, if not a want of information, as to their importance in giving a finish to the homestead. How often in dwellings with a neat and beautiful exterior, and surroundings to correspond, all denoting taste and elegance, is the whole effect almost destroyed, certainly made any thing but attractive, by the want of judgment in interior decoration. It is often the case that apartments are richly furnished, but the glass frames, cornices, &c., are entirely at variance with the style observed in other portions of the furniture, and unsuited to

the size of the room, or the space the glass is to occupy. The result is, that however handsome the style of each, neither can look well, because they do not match, and this mars the harmony of all. It is, in point of comparison, like driving a pair of horses, one a heavy draught animal, and the other a slender, wiry, race-horse. The contrast is equally marked in both cases.

The consequence of failing to give this subject proper consideration is, that after investing a large amount of money for the purpose of having handsomely-furnished apartments, you are disappointed, and an unsatisfactory combination becomes more apparent every day. Now, it is an easy matter to avoid all this trouble and vexation. After furnishing the apartment to suit the taste, with the exception of looking-glasses, cornices, &c., it would be well to visit an establishment where the manufacture of the last-named articles is made a distinct business, and select, from their many designs, such as are suitable for, and in harmony with, the furniture already purchased. This is the most certain plan of securing ornaments that will please the most critical eye, and be in keeping with both the exterior and interior of the mansion.

In reviewing the rise and progress of ornamentation, it is interesting to compare the past with the present. When we go back to 1850, we find one small shop in Canterbury, Orange county, New York, running, by water-power, the first machine ever used for this work, and employing some five or six hands. This was the only source, at that time, from which the trade of the country drew its supplies. There are now about fifty large establishments, employing from fifty to one hundred hands each, with perhaps as many more of lesser capacity.

Among the former, we will mention the Looking-Glass and Picture-Frame Manufactory of Messrs. Hall & Garrison, 928, 930, and 931 and 932 North Third

street, Philadelphia, occupying buildings on both sides of the street. These extensive works contain the most useful and latest improved machinery for completing all styles and patterns. Much of it is of their own invention, for which they have secured patents. This firm has a large lumber yard attached, which is generally stocked with about 1,000,000 feet of well-seasoned walnut and pine lumber.

It became a necessity with us to visit this, or some other establishment of the kind, in order to realize, to the fullest extent, the progress made in this particular branch of business; and we are much indebted to the proprietors and gentlemanly employés, for their kindness in answering questions and giving explanations, and the promptness with which they furnished the writer a number of historical incidents connected with the trade. After looking over the attractions that meet the eye at every turn in this vast museum of art, we could scarcely restrain a smile, as our mind reverted to the little Canterbury shop.

It is proper to remark, that one of the above firm may be justly styled a pioneer in the great revolution achieved in ornamentation, as he was one of the first to apply machinery to the business, run by motive power. His priority in preparing moulding with a practical machine, and in moulding the wood by a similar process, is conceded. He was one of the few Canterbury operatives already spoken of, and has applied himself closely to the business ever since.

This firm is changing their style of ornamenting, with the view of attaining greater durability, while maintaining the same, if not a more skilful finish. For some time they used what is known in the trade as Composition or Compo, for making ornaments, which were pressed in moulds made of box or apple wood. It is needless to say that these moulds proved to be very expensive implements, because it required an immense number

of different patterns to make the various styles demanded by a great diversity of taste. In fact, every enterprising firm invests several thousand dollars each year, for new moulds; and, as the fashions change with time, many are thrown entirely out of use each year to give place to others.

It was discovered that ornaments made of compo did not retain, for any length of time, their original appearance; for they exhibit, after a few years, evidence of decay, and begin to crack and crumble in small pieces,—thus destroying the appearance of the once attractive frame. This defect becomes more apparent on large ornaments. To obviate this great disadvantage, the firm above alluded to, resorted to the use of a material known as Carton Papier, which is moulded in piece moulds made of Plaster Paris. This is an old method revived, but greatly improved, for which Messrs. Hall & Garrison have the patent, and theirs is the only establishment in which it is used. Its utility is enhanced also, from the fact that the patentee is employed by them.

These ornaments, improved as they are, will last longer, and prove more durable, than the wood itself. Indeed, it may safely be asserted that ornaments made of carton papier maintain a great superiority over compo, or any other material, known to the trade. It cannot crack, or separate, like the latter, and the mode of making ornaments out of the former, enables the operator to give the design all the relief and finish necessary to complete a handsome article. This last method of making ornaments out of carton papier will no doubt become generally used in the course of a few years, for we cannot see how it is possible to discover a more suitable material, or a better method for making the innumerable variety of ornaments now employed, as well as the numerous styles that will be designed in the future.

At one period, ornaments made of

lead, it was thought, would answer every purpose. The experiment was tried, and proved a failure. The principal difficulty was caused by the gold losing its brightness, when placed on a leaden surface. At all events, it soon assumed a dull, lustreless appearance, and its use was totally abandoned. We learn that as much as 500 pounds of lead have been used in ornamenting one frame. This extravagant use of the metal would be sufficient to condemn its availability.

There was also a large amount of capital wasted in attempts to make this style of moulds out of brass; but little, if any success rewarded the efforts of those who made the experiment; and whatever may have been accomplished by this method, must become unavailable in a very short time.

Before we close this article, we would suggest to the press of the country the propriety of giving wide publicity to the intrinsic merits of Carton Papier as the best and most durable substance from which to obtain ornamentation more perfect and lasting. The gentlemen we have alluded to have turned their whole attention to this article; and in their issue of new patterns and designs, have kept in view the sole use of carton papier. As the public become familiar with this improvement, the old style of ornamentation will gradually become obsolete; for a handsome looking-glass is quite a costly article of furniture, and those inserted in frames of attractive style, ornamented with this durable material, will be generally preferred.

Latterly, solid black walnut has come into very general use in the manufacture of picture frames. This is relieved in some degree with gold, and presents a very pretty appearance.

We noticed at the establishment of Messrs. Hall & Garrison, a new machine, which they have recently invented, for making and preparing an inside, designed to be gilt and placed in front of a Walnut oval. It is well adapted to

the purpose, and will no doubt be generally adopted by the trade as the most convenient facility for relieving the walnut, and giving a tasteful finish to the frame.

CUTTING TIMBER TO LAST.—At the New York Farmers' Club, the question was discussed as to the best time to cut timber for building purposes, in order that it may last a long time without decay. Mr. Skinner, who has, perhaps, the largest experience in this matter of any one in the county, said he would always cut when the timber is frozen. He was aware that other seasons of the year are recommended. He had tried all seasons, and with a number of species of wood, and no timber lasted so well as that cut in winter when frozen. He said a hemlock stick used as a stringer for bridges will last longer when the bark is left on. He had observed it often, and gave as a reason, that the bark kept the wood moist. He thought the best timber for sills, or building purposes, is red elm, next in order is oak, white elm, or red beech. For pins, the raves of wood-sleds, and bolsters to wagons, there is no timber to be preferred to red elm.

MEASURE OF AN ACRE.—The Maryland Farmer gives the following table of distances, by which it says an exact acre can be found:

5 yards wide by	yards long, contains	1 acre.
10 " " " 484	" " "	1 acre.
20 " " " 242	" " "	1 acre.
40 " " " 121	" " "	1 acre.
80 " " " 60½	" " "	1 acre.
70 " " " 69 1-7	" " "	1 acre.
220 feet " " 198 feet	" " "	1 acre.
440 " " " 99	" " "	1 acre.
110 " " " 369	" " "	1 acre.
60 " " " 726	" " "	1 acre.
120 " " " 363	" " "	1 acre.
240 " " " 181½	" " "	1 acre.

Through the intervention of M. Magne, Minister of Finances, the sum of 50,000fr. has been granted for the restoration of the Cathedral of Périgueux.

CITY ARCHITECTURE.

THE Roman Emperor Nero holds, in history, a very discreditable position, for his many cruelties. But there is one act of his, which will ever stand out in bold relief, as the very worst, because, in its comprehensiveness, it was the greatest act of wickedness, within his power to perform. We here allude, of course, to the incendiary act, which so nearly destroyed the city of Rome. The coolness, too, with which he amused himself, in view of his arch bit of mischief, for

"Nero fiddled while Rome was burning,"

might still add a blacker mark to the indelible score, which history has attached to his name. It may be a blemish, in the reflective power of our judgment, which causes us to find a palliative light in this darkness of character, at least as far as the conflagration in question is concerned; and, no doubt, the classic and virtuous reader will at first shrink from the bare mention of the idea, that Nero, in this act of burning shame, was not so great an enemy to society as then appeared; even though nineteen centuries since have not improved his fame: for, no one ever has publicly questioned the sheer barbarity of the crime. Now, we, as lovers of architecture, are naturally prone to do, what justice can be done to his good intentions, in this apparently most flagrant sin; and, with that view, we ask of the reader to bear with us; and, banishing prejudice, consider the *merits*, such as they are, of the case.

Nero was an ardent lover of architecture, in his day. It was his ruling passion; as it was that of another bad prince, who since ruled England, under the title of George IV.

The dwelling-houses of the Romans were, for centuries, but one story high, each surrounded by a portico, which served as the passage to the rooms, the

only light being through transoms over the doors of these rooms. Towards the close of the Commonwealth, the houses were of two stories, the upper rooms being for festive purposes.

When Nero took the imperial purple, Rome was any thing but agreeable to taste. Its streets were narrow and irregular. Its houses of various heights; and, in fact, it presented much the appearance that Constantinople does at this day, with the exception, that the city of the Sultan shows a palace, which Rome, at that time, could not. Sixty-four years after the birth of Christ, the overwhelming conflagration took place, which left the greater part of Rome in ashes. Now, whether this was the secret act of Nero, carried out by his hirelings, or the awful consequences of a mere accident, no one can say; but certain it is, that Rome was burned, and that the Emperor appeared to enjoy the catastrophe. Well, we said, that Nero had a love for architecture; and, by consequence, had a hatred for Rome, as it then stood. So, when the fire (which was, nevertheless, a purifier in this case) had completed its work, the Emperor began to indulge his taste; and laid out the streets in greater breadth; in fact, so broad that the citizens complained of his leaving them scarcely any shelter from the sun. The houses were built up to five, six, and even eight stories, and each dwelling was fenced round with ornamental curtain walls, and had its court yard. Nero not alone did this for Rome, but he commenced, and all but completed, one of the most magnificent palaces, which that age of the world could boast of. So superb was this imperial residence, that Pliny, the historian, speaks of it in terms of laudation sufficient to carry the mind into oriental romance. He calls it the *domus aurea*, from the gold ornamentation, which

shone on every side. In the vestibule stood a colossal statue of Nero himself, of the immense height of one hundred and twenty feet. There were three porticos, each a mile in length, and supported by three rows of pillars. Inside this palace the rooms were lined with gold, gems, and mother-of-pearl. The ceilings of the dining-rooms were adorned with ivory panels, so contrived, as to turn round and scatter flowers and shower perfumes on the guests. The principal banqueting-room revolved upon itself, representing the motions of the heavenly bodies. The baths were supplied with salt-water from the sea; and mineral-water from the Albula. Such was the palace of Nero. But, it is not to all this selfish outlay of the public treasure, that we wish the reader to look, as to a bright spot in the character of Nero. It is to the fact, that he was the first to lay out streets, with any thing approaching symmetry, if not elegance. As we have said, he found Rome crowded, dirty, and inconvenient; and he gloried in the progress of the devouring element, which was to make a clearance at once, that his enlarged ideas, of what a city should be, might have a fair chance of being realized. "Out of evil cometh good;" and from the crime of the incendiary sprung up the blessing of a renewed and vastly improved city. Can we not all, even here in our American cities, look back, with a feeling of positive pleasure, on the purifying effects of the visitations of extensive fires? There are instances, north, south, east and west, of these wholesale destructions, which, at the time, caused the nation's heart to shrink; and, in no one case, has the calamity failed to eventuate in beneficial results, to the cities visited by its fiery scourge. Such seeming misfortunes, then, are truly blessings in disguise; and Nero, wretch that he was, in a humanitarian point of view, was no less a benefactor of his race; and, to this day, we feel the advantages, which his taste in street-

architecture has conferred upon the civilized world.

Augustus had previously restrained the desire of the Roman citizens for building houses of inordinate height, confining them to seventy feet. Trajan, subsequently, would not permit any residence, to exceed sixty feet. So, these emperors controlled the fashions in building, and compelled their subjects to have regard to the general appearance of the streets. Consequently, Rome became a city, such as was never before seen, or perhaps thought of.

It is not in the nature of republican institutions, to submit our varied taste to the will of one man. But, if the architects, who are really the manufacturers of taste in building, were to be more under the control of one grand idea, namely, the unity of feeling in the construction of the houses, which form a street, we might have cause to rejoice in the influence their government of the architecture of our cities would inevitably display

But, unhappily, it is not alone the private buildings, but the public ones, which are constantly rendered inimical to taste and propriety, by the overruling authority of individual power, either monied or political, controlling the architect and enforcing that which is either inexpedient, or altogether adverse to the public comfort; or the rules of taste, by which such buildings should be governed for the sake of the city. How often do we see municipal buildings put up, without regard to any thing, save a deference to one-man power, or to *one-party* power, which amounts to the same thing. And how frequently do we see those ill-advised erections, after a few years, pulled down to the ground, from which they never should have started, to be replaced by becoming structures, which might have been built at first. Municipal governments are apt to be short-sighted, in such matters; and, most unaccountably, build, as though their reign was the climax

of the city's progress; the goal beyond which it were utopian to dream. But cities will grow, while civic rulers die; and succeeding generations will question the common sense of those, who could not discern, in the inevitable future, the increased value of the property, for which the tax-payers would one day be compelled to provide; the which they could most easily have been provided with, at an accumulating interest, had their dead "*conscript fathers*" but secured their interests, when they could have done so most economically and wisely.

In this way, we find our Western cities, in our day of "park fever," com-

pelled to pay enormously, for what might have been secured to them, but a few years back, for a comparatively trifling sum. And so it is with public buildings. We could cite many cities laboring under the misfortune, to-day, of an exhausted treasury, amid growing demands for "room, more room."

Fire may be a destroying demon for the time, as Nero was an absolute tyrant over those he ruled. But, either, or both, of those monsters might do good, to posterity at least, the one in destroying barriers to improvement; the other in enforcing the principles, which curb a community to its own ultimate good.

THE DOME.

THIS beautiful feature, in Architecture, whether copied from the cerulean canopy which overhangs our globe, or not, has certainly a most inappropriate name; coming, as it does, from the Latin word *domus*, a house. The Italians apply the term *duomo* to a church; signifying "the house of God." But, what we accept, as the meaning, is a certain description of arched covering for the principal part of a building, civil or ecclesiastic. In the church, it canopies the altar; in the civil building, it crowns the rotunda, or great hall.

In both Civil and Ecclesiastical Architecture, we find domes of great size, and every way worthy of the closest observation of the amateur, or the professional architect. The remains of such structures still existing in Europe display, in an eminent degree, the skill and geometrical knowledge possessed by the designers and artizans of those days in which they were executed. In the golden age, when Augustus Cæsar added so many treasures of art to the Roman empire, was erected that wonderful dome (considering its early date in the history of such constructions) which stands to

this day as a proof of the perfection of its execution, the PANTHEON—then, as its name denotes, dedicated to "all the gods;" now, under the Christian dispensation, entitled SANTA MARIA ROTONDA—whose statued niches, which once exhibited the heathen deities, now present the effigies of all the Saints. This, the most magnificent dome of antiquity, is still entire. It is in the form of a hemisphere, enriched with panels, or coffers; and terminates above with a circular curbed opening, called *the eye*. The dimensions of this great dome are:—Internal diameter, 142 feet 8½ inches. The eye, 28 feet 6 inches in diameter. The height of actual dome, 70 feet 8 inches. It is composed of bricks and rubble. The thickness at the base being 17 feet, at the top 5 feet 1½ inches.

The circular wall, which supports the dome, is 20 feet thick; but is divided by several large openings, and has discharging arches of brick.

This dome is perfectly incombustible, and as such, as well as being exceedingly economical, for the times, and very durable, may be looked upon as the best covering that could have been

designed, for such a vast open area of building as the Pantheon.

We will pass over a number of lesser constructions, to review the next dome in size.

SANTA SOPHIA, AT CONSTANTINOPLE, built in the reign of Justinian, is the earliest construction of dome, after those of the Romans, and perhaps one of the most remarkable in history. The architect, Anthemius, proposed to the Emperor to erect a church, the dome of which should far transcend that of the Pantheon. Assisted by the architect Isidorus, he made his design, which in vaulting ambition, certainly surpassed any thing that had been yet thought of. Justinian was struck with the sublimity of the thought; and ordered the architect to put it in execution. Anthemius commenced by erecting four pillars at the angles of a square, 115 feet from each other, and 112 feet high. He turned arches over each of these openings, and corbeled out the corners; until, at last, he formed a true circle. On this circle, he raised his dome. Whilst constructing this circle, or ring, he built up heavy walls, auxiliary to the piers, two against the north and two against the south sides. These walls were each 90 feet long, and built up to counteract the thrust, which was making palpable demonstrations in that direction. But scarcely had he secured himself on the north and south, when the east and west piers showed symptoms of rebellion. To meet this difficulty, he built up a half-cylinder on the east side, and another on the west, over each of which he turned a half-dome, so as to abut against those arches; conceiving such support to be sufficient. But it proved not to be equal to the occasion, for the dome pushed out, and after lingering a few months, fell; carrying with it one of those half-domes.

This casualty so affected Anthemius, that he fell into a state of despondency, which shortly ended in his death. He was succeeded in office by his coadjutor

Isidorus, who at once set to work to increase the resisting parts, and strengthen, by filling up all open work in the span-drills, which were designed for lightness by his predecessor. But, it again gave way. He then buttressed the east and west arches, by powerfully built cloisters, on the outside of the cylindrical walls before mentioned; from these he constructed flying buttresses, which he intended should make his dome secure. But, all his devices failed; and, before the new dome had reached half its altitude, it once more hurried to the ground. With his main arches either overset, or badly fractured, the poor architect studied in vain to carry out the original thought of Anthemius; but finally had to multiply small arches, and reduce the overpowering weight, by using *pumice stone*; besides filling up the northern and southern arcades with more solid work, and three stories of arches. At last the dome was finished. But, how different was the plan executed from that designed!

Since the followers of Mohammed came into possession, and St. Sophia assumed the worship of the Mosque, the Turks have tenanted the cloisters with motley stores for merchandise; and the whole is surrounded with narrow, filthy streets, or rather lanes, rendering it any thing but admirable externally. The dome at present, looms up beautifully, when Constantinople is viewed from the Golden Horn, beneath the harmonizing influence of an oriental sky.

There is much allowance to be made for the failure of the original dome of St. Sophia, when we consider the crude condition of science on this subject at that time. In succeeding ages, St. PETER'S, AT ROME, far surpassed the great Mosque, and in diameter, was second only to the Pantheon. So much has been said by scientific and literary writers about this stupendous cathedral, as a whole, that we will avoid all allusion to any thing outside of that which directly concerns our present subject,

the dome. This was the conception of Michael Angelo, and so completely did it possess his mind, that he might have truly said :—

"Still shall thou be my waking theme;
Thy glory still my midnight dream."

And a glorious creation it is, when taken by itself, apart from all detracting surroundings.

As we have seen at St. Sophia's, the idea of construction, in domes, was on strong piers, arched together on the square, and the circle, or ring, made up of corbeling. The architects of succeeding generations continued this practice, up to the time of which we write. Michael Angelo at once produced a grander effect, by substituting for the corbeling, double consoles. On these, he constructed a small cornice, which served as an impost for eight arches, upon the upper part of which he built the dome. Externally, the plinth is an octagon; internally, a circle. The diameter of the octagon is 192 feet 9 inches, that of the circle, 134 feet $8\frac{1}{2}$ inches. The thickness of this plinth at its lesser section, is 29 feet 3 inches. On this plinth, is a circular stylobate, 28 feet $6\frac{1}{2}$ inches thick. This thickness is divided by passages, respectively 5 feet 10 inches, and 2 feet 10 inches wide. These latter form flights of steps, communicating with the four spiral staircases formed in the thickness of the wall of the drum of the dome, which is raised up by the circular stylobate 12 feet $4\frac{1}{2}$ inches, and is 10 feet thick.

The construction is of broken brick and rubble masonry; the interior being formed of hard bricks stuccoed. Externally, the work is faced with thin slabs of Travertine stone, which was, by order of Sixtus the Fifth, covered with lead; and the iron bands, with which the brickwork was held together, with bronze gilt. These iron bands are 3 inches wide, by $1\frac{3}{4}$ inches thick.

The visitor to St. Peter's will observe, as he surveys the interior of the dome from above, several cracks of a seem-

ingly dangerous nature, in the wall or ceiling of the dome. These were caused by the hurried manner in which the work was done, the mortar not getting time to set. Settlement was the natural consequence; and to such an extent did the mischief go, that the iron band surrounding the inner circle was fractured. This, however, was repaired, and six additional circles placed around the outer dome, so as to render it perfectly secure.

ST. PAUL'S CATHEDRAL, LONDON, shows another great construction of dome, which may well rank foremost, as a wonder of mechanical design, and skill of execution. Although less in size than St. Peter's, it does not lose any thing in the comparison, on the score of construction, proportion, and general effect.

We do not propose to enter into detail on the subject of the construction of this beautiful dome, of the great London Cathedral; but will shortly proceed, with our reader, to survey the vast advantages, which progressing science has thrown around such constructions in this our day. The Dome of the Capitol at Washington exhibits a variety of construction entirely different from any to which we have alluded, being fashioned wholly of iron; we do not, however, propose to extend the present paper by speaking in detail of that structure; preferring to reserve it for a future article.

The Pacha of Egypt is having a theatre built in the principal square in Cairo. No less than 7,500 workmen are laboring at it day and night. The architect has received orders to have it finished in two months. And for what has this enormous work been undertaken? Simply in hopes of inducing Mme. Schneider to accept an engagement on its boards! In brief, the offer made the fair enslaver is the munificent one of 50,000fr. for ten performances, without reckoning perquisites.

COLOR OF SHADES OR BLINDS.

BY H. H. CORBIN, BETHLEHEM, PA.

IN a recent number of the "London Gardeners' Chronicle," I noticed an article headed, "Shading for Houses," by Major J. Puckle, of Bangalore, India, in which, while speaking of the "tatties" and "chicks" used, in that tropical climate, to shade the houses, he states, that he experienced a vast difference, in the amount of glare, while using tatties of different colors. The letter runs:—

"BANGALORE, September 9th, 1868.

SHADING FOR HOUSES.—In several of your late issues the question of occasional shade for glass-houses has been discussed; laths hinged loosely together so as to roll up have been suggested, and this at once brought to mind the bamboo "chicks," we use here, to keep out glare; they are merely split bamboos, of varying thickness, according to the use to which they are to be put, tied loosely together with string, at intervals of say six inches, so as to roll up when required. [A common mode of shading on the Continent, where the bright light admits of continuous summer shading.—Ebs.] These are often covered with blue cotton cloth inside, and are very efficient. Cuscus "tatties" are used for a like purpose; they are similarly made of the fragrant roots of the Cuscus Grass, admit more air than the lined "chicks," give a better shade than those not lined; and when the hot winds blow, if the "tatties" are watered, the temperature is much reduced and the sense of smell gratified at the same time. "Tatties" of coarse grass are also used, and it occurs to me that these "tatties," made of coarse grass, or rushes of any kind, would be admirably suited for glass-houses in summer in England. From their construction they would be cooler than the laths, or tiffany blinds, or other expedients, as these absorb and

keep in the heat greatly, while a "tatty," with its rugged surface, does not. I have tested this often, and have found that a grass "tatty" would feel cool to the touch, when a paneled shutter similarly exposed would be unbearable. The facility of shading and their cheap construction will, I think, commend "tatties" to every glass-house owner. I have sent you small pieces of a Cuscus "tatty," and of a "chick," as samples; they have been made very fine to go by post, but they can be made as coarse as desirable. They might also, perhaps, be useful in keeping the temperature sufficiently high in autumn and spring, before regular fires were commenced, or discontinued, and thus serve a further economical purpose.

I had an enclosure of thick grass "tatties," as shelter for plants from the sun and wind, during our late hot weather this year. It was eight feet high, and covered with a flat trellis-work of thin strips of bamboo, with the sides of the apertures about one-third of an inch; this afforded complete shelter from the hot, driving, easterly wind, though plenty of air was stirring inside, while the lattice-work covering admitted a chequered sunlight or "half shade" that made the temperature very agreeable; two and a quarter feet were dug out from the surface, and three inches of sand overlaid, which made the flooring two feet below the surface. By this rude contrivance an excellent shelter was made in the hot season for many plants that would otherwise have suffered, while the lee walls outside served for shelter from the wind for more hardy plants. We find the wind is a much worse enemy than the sun; in fact, if we had good shelter from wind, and plenty of water, we should not complain of too much sun.

By direct experiments with two thermometers placed on the ground about noon, in a hot day at the end of March, I ascertained that in the enclosure the temperature was 99°, while on the ground, in the sun outside, it ranged to 120°, after half an hour's exposure. The places of the same instruments were then changed, and noted after another half hour's interval, with the same results."—

"As a further hint to any one attempting a 'tatty,' or a 'chick,' I will give my experience with the latter at Aden. When my regiment was there, in 1851, I had bamboo 'tatties' put up around a small verandah, which shut out much glare. In order to increase this grateful shade I had the bamboo strips painted dark green, but to my surprise the glare was then found to be intolerable; the color of the bamboo, so much the hue of the sandy dried-up earth all round, afforded relief, while the dark green color was such a contrast to it that there seemed to be no protection at all."

From this, he evidently attributes the increase of glare or light, to the *color* of the paint, in which, I think, he is mistaken, as there is no scientific reason for it. That there was a decided increase of glare, while using the *painted* "tatty," instead of one of the natural color of bamboo, there is little doubt; but he is probably wrong as to the cause of this phenomenon.

My opinion is, that it was due to the *nature* of the paint, and not the *color*. That is, on account of the constituents of the paint, there was a certain *brilliance* given to the surface of the bamboo, which, from the fact that every curved or irregular surface is composed of an infinite number of planes, presented a series of *reflectors* (you may say) thereby causing a quantity of light to be diffused through the room, which was not the case with the natural, dull colored surface of the bamboo. This easily follows, from the well-known law

in Physics, that the amount of light reflected from a surface increases with the degree of its polish.

Had the Major tried a dark green paint, without any ingredient to produce in it the property of reflecting incident rays, I think the result would not have differed from that yielded by the natural dull colored bamboo.

While on this subject, I remember often having heard the following question discussed: "Why is a blue or green window-blind, or shade, better for the eye than one of another color?" Now, there is really no scientific ground for this assumption, neither is either any *better*, than any other color, nor does either cause less injury to the organ of vision; but, to borrow the words of a certain Physicist: "The reason that a blue or green window-shade seems more grateful to the eye than one of other color is, probably, because almost every thing in nature—the sky, grass, foliage of trees, &c.—presents one of these colors, which accustoms the eye to them, thence the pleasant sensation produced by a blind of said color."

LEHIGH UNIVERSITY, BETHLEHEM, PA.

EDITOR'S NOTE.—Many bamboos have a highly-polished light-reflecting exterior; and they are often set on fire from their own motion, in violent winds, on account of their silicious surfaces striking sparks with each other, as flints, the inner fibre, exposed in cracks, or breaks, readily igniting; but bamboos differ much in surface and hue. For the rest, green, blue and black are retiring, or light-absorbing, in the order named: they must, therefore, be better for objects habitually near the eye, than red, orange and yellow, which are intensifyingly advancing, or light reflecting.

CORRECTION.—In our January number, we were led into an error in naming Mr. THOMAS as the architect of Booth's Theatre, New York, Messrs. RENWICK & SANDS being the party entitled to the credit.

APPROPRIATE DESIGN

IN

FLOOR MOSAICS AND CARPETINGS.

FLOOR DECORATION is measurably well understood and practiced by the manufacturers of marquetry, encaustic tiles and stone mosaic, not unlikely owing, somewhat, to the nature of the materials, wherewith they work; and the public are, consequently, pretty well educated in the desirable points of these three kinds of permanent foot-rest. But the ornamentation of oil-cloth, or of carpet, which latter may properly be called—according to plainness or pretension—the clothing or costume of the floor, is a matter entirely misunderstood—or at least unpracticed—by most of the manufacturers and the mass of the purchasers.

Dismissing at once, the homely, substantial web, known to everybody as “rag carpet,” which, though inevitably parti-colored, in itself, and wilfully striped and banded, by the weaver, in the utterly forlorn hope of beautifying it, is only endurable for the very hardest use—passing lightly over “Wool Dutch” and other serviceable, but most unornamental fabrics—and saying only of “Venetian,” that it is a kind of sub-pedal string-course, out of which little grace can be expected—we reach those styles, which all makers try to adorn, to the best of their ability—for the price!—which all wearers select, with one eye fully directed to durability and the other furtively cast towards embellishment.

In the “Persian” and the “Turkish” we have no right to expect aught beyond luxurious thickness and softness, and a rich commingling of mechanically broken colors, in the peculiar general style well exemplified in Cashmere and other shawls. It is not of such patterns we speak; but of those exhibiting set distinct design.

If we take the “ingrain,” two or

three-ply, the uncut-velvet or “Brussels,” or the “velvet” proper, we are almost invariably confronted with highly successful attempts to produce vines, leaves, flowers and other objects, animate or inanimate, in high relief.

Here are meant the best of any of these kinds, so far as materials and webbing are concerned; because, generally, inferior goods have more of the true, integral, carpet design, about them, than superior fabrics. But when the cheaper specimens do emulate the high relief of the costlier ones, the result is fearful to behold. Alongside the meritless familiarity of such, cotton velvet and paste diamonds veil their ineffectual sheen.

Let any one of moderate cultivation, ponder the true perfection of a floor. Wherein does it consist? Manifestly, if bare, in its perfect evenness, adapting it to easy, rapid gliding movement of the feet; if covered, in the smoothness of the oil-cloth, or the matting, for summer, and the springiness and warmth of the mats, carpets, rugs, &c., for the other seasons. Remember, also, that the comfort of the body is most subtly, but very appreciably, affected by the condition of the mind. Now, were all the contorted or flowing scrolls, flowers, fruit, depressed panels, ensigns, animals and faces, actually existing, promiscuously heaped and crowded, upon the floor, in high relief, as they are shown by many oil-cloths and most carpets, the feet could find neither ease nor comfort, in stepping amongst them; and the mind would rebel at the multiplied vari-colored entanglement. The whole laborious effort to please is misplaced. If the elaborate rug, before the low-down grate, containing the verisimilitude of a lurking tiger, a bounding leopard, a recumbent lion, a running stag, or a stately charger, costing a price mounting well towards that

of a fine oil-painting, were fairly treated as a picture, and hung upon the wall, being, as it really is, an artistic cartoon, executed in fine wool, it would be exactly in place; and the mind, once content, the eye would be gratified. So with the elaboration of vines, leaves, blossoms, flowers and fruits, in the carpeting used as wall-hangings. If the exhibition of "thick-pleached" nature were congruous, that is, if bourgeon and leaf, bud and fruit, belonging to different seasons, five or six months apart, were not all displayed together, both mind and eye would be satisfied, as in the other case. Nay! as cornice festoons, or ceiling tracery, all these gorgeous reliefs might please; but what consistent individual can submit to their resurgent challenge beneath his feet.

A sort of compromise with the congruous underlying principle, here advanced, appears in many patterns of "office Brussels," wherein panelings are formed by the interlacing and re-interlacing of broad parti-colored bands. This supposes the thickness of the carpet to be raised at all the intersections, which, therefore, if real, would be apt to catch the toes and cause tripping. Now, some may smile at this, as a super-refinement for a sub-support; but there is, actually, a great deal in it.

The true law is this: All enrichments of this description should be drawn in outline and tinted flat. The expression of the parts of all objects must also be in simple lines. All shades and shadows are tabooed. Whenever this simple position is chosen and maintained, the result must be right. It does not matter what are the subjects presented. All nature, animate or inanimate, and all art are fully admissible, under this simple restriction.

The partly-educated designer will exclaim, "You first bind us and then bid us fly!" Not at all. Any one, pretty conversant with the superb geometrical designs of the Arabians and of the Moors of the Middle Ages, displayed

in the mosaics of their court-yards, and the stuccoes, or carvings, upon the walls and ceilings of their palaces, as set forth in the magnificent works of Murphy and others, will be ready to assure the disconsolate, that unnumbered generations of genius could not exhaust this peculiar vein; while those who have glanced through Hay's folio upon Design in Carpetings will also be prompt to dissuade the designer from despair, as it is palpably evident, from the latter, that modern outline art is as fertile as that of the Dark Ages.

If the designer were restrained merely to lines, the scope afforded him would be inexhaustible. But how shall we term his field of action, when he may not only use all the primary, secondary and tertiary colors, pure, in every possible combination of mechanical juxtaposition, but can equally indulge in all the tints and hues, produced by and from the above, besides the further variety obtainable from the general tone, which may be either geometrical, or chromatic, or both.

Working upon this fundamental principle, the best carpet manufacturers of Europe have produced some charming specimens, as depicted in the rich and costly plates of the Reports, Displays, Descriptions, &c., of the various great National Competitive Collections, from the original World's Fair of Great Britain to the late Exposition of France.

It is, indeed, a feast for the eyes, to turn over these combinations of sweeping lines with unmingled colors. The method is equally applicable to the most intricate, as well as the simplest subjects; and in these days of pseudo-art, mistaken art and art run mad, in the matter of oil-cloths, carpetings and floor-cloths, happy is that family, possessed of true taste, in this direction, which has been able to gratify such taste; for falsely flourished carpets in relief are many; but true, flat carpets, with their patterns in outline, and their colors bright, plain, and plane, are few.

COMPOSITE COLUMNS.

THE ALBERT MEMORIAL.

THE four sculptors engaged on the great Albert Memorial, in Hyde Park, which, it is stated, will cost about £190,000, are Messrs. M'Dowell, Foley, Theed, and Bell, who take respectively Europe, Asia, Africa, and America. Each sculptor gets £3,000, and they all complain that they will be out of pocket.

Here is an outlay proposed of over one million three hundred thousand dollars on an art-effort, which may, or may not prove a failure; and which, at the very best, will be but a thing to look at and admire. What suggestion will it convey to the spectator? Why, that it is a fine work of art, and the four sculptors, very admirable at their profession. The Prince Consort's character will not be thought of through this senseless mass of material. No, his spirit would be present in another, and a far nobler monument, where gratitude would live within, and admiration of the man be the feeling from without. We mean a true memorial, such as that which will ever enshrine the embalmed memory of PEABODY.

A GOOD IDEA.—General R. E. Lee, believing in the young men of the country becoming as practical as possible, in addition to the schools of civil and mining engineering and practical chemistry, has now in operation at Washington College a practical department for the benefit of young men who wish to become master workmen as carpenters, machinists, etc., in which the students are instructed in the principles of mathematics required, and the use of tools. This department will be of great service to the country in furnishing thoroughly practical men for the development of the South.

A CHEAP CELLAR ICE-HOUSE.—We find in the columns of the *Rural World*, (an agricultural weekly of much merit,

published at St. Louis,) the following description of a domestic ice-house:

"It is built in one corner of the cellar; consists of two walls of brick, which partition off a space twelve feet square. The bottom is dug out a foot and a half deeper than the cellar floor, making about eight feet in height, from bottom to ceiling. The joists overhead are ceiled; the ceiling coated with gas-tar, and then sanded upon the fresh tar. A door-frame is built in the wall, with two doors hung in it. The bottom is cemented. The ice is put in through a cellar window; a drain carries off water from the melting ice. Small poles are laid across the bottom a foot apart, and straw laid upon them, then the ice is packed so as to leave about a foot space between the walls and ice, which space is packed with chaff. About the same space is left between top of ice and ceiling, which is also filled with chaff. As the ice settles away in the spring (before we commence using it) we put in more chaff. We ventilate from the window, and have plenty of ice till the middle of September. We first partitioned off for ice room with boards, with double walls, (ten years ago,) packed with saw-dust, which we had to haul three miles. We afterwards found our walls were decaying, and took down and replaced with a single wall of brick—tried straw one year, but the ice did not keep well—have used chaff for a number of years and are pleased with it—as it is home-grown it has to be hauled but a short distance. It takes between eight and ten loads of ice to fill the room, and is easy of access from the cellar where the cream is kept and churning is done in summer. We like the plan and would advise any one having a large cellar, and wanting an ice-house, to go and do likewise.

"RUSTIC."

QUERIES AND RESPONSES.

VERBUM SATIS EST.

J. C.—It was Inigo Jones, who first introduced the Palladian Style into England, from Italy. He was born near St. Paul's, London, in 1572; served his time as apprentice to a joiner, and showed so much talent, that he was noticed and advanced, promptly and liberally, so that he became the favored architect of King Charles I., over whose tragic fate he is said to have grieved himself to death. When surrendering the position he held under that unfortunate monarch, he is said to have made this witty remark: "When I came into office it was In-i-go Jones; but now it is Out I go Jones." He was 79 years of age when he died in 1651. As a promoter of classic taste, at a period when architectural design was in a most depraved state in England, Inigo Jones has left behind him many enduring monuments, to perpetuate his fame.

STUDENT.—Pediments were first formed, as architectural features at the ends of the temples, in the city of Corinth, in Greece.

QUERO.—The works you are anxious to obtain are not likely to be in the hands of our American booksellers, but any of them will receive your order, and purchase them for you in London.

R. T. M.—The hanging gardens of Babylon were erected by Nebuchadnezzar, in connection with his palace, to please his Queen Amyetts, they consisted of terraces formed by rows of piers, upon which were placed large, flat stones, over them a layer of reeds, mixed with a quantity of bitumen, above which were two rows of bricks, closely cemented together by plaster. Thick sheets of lead again covered these, and over all was laid the mould of the garden, so deep, that it would admit the largest trees to take root and grow. In the upper terraces there was an aqueduct, or engine, whereby water was drawn up out of the river.

C. A.—The climate of this country is, like that of the finer portions of Europe, favorable to the materials of art. In the British isles, *tin*, for instance, could not be used on roofs; for the simple reason, that it would rust out, in a few weeks. Approaching the city of Quebec, the visitor, who sails up the St. Lawrence, beholds, with astonishment, the roofs and domes of apparently burnished silver—and finds that they are *tin*, *glistening in the sunshine!*

J. S. I.—Your ideas on Indian Architecture are good; and, if put into the form of an article, we would gladly give them a place in our columns. We have already reviewed this subject, but any thing in addition would be welcome.

M. M.—The perforations which you have seen on the face of the stones are produced by a nitrous acid, which combines with calcareous earth, and forms what is termed earthy soft *patre*. Of the former, where there is a putrid fermentation of animal and vegetable matter in hot countries, it is known to effervesce from the earth in large quantities, so as to destroy the very masonry of houses. The exfoliation so generally noticed in the sandstone cornices, belt-courses, and trimmings of buildings in the various sections of this country may be in great part ascribed to this reason.

F.—Send on your drawing and description.

DIVIDERS.—The origin and derivation of Oriel-windows is unknown. They are of great antiquity. Your idea that they are of *Oriental* origin is as probable as any other, as they are frequently met with in the East of Europe.

A YOUNG LADY is informed, that architectural drawing is a most interesting, as well as profitable employment for her. In fact, it has always been a matter of surprise to us, that an art which is so intimate with all the graceful thoughts of which the female mind is so naturally susceptible, should not have been long ere now the study of the sex.

OUR MANUFACTURES REVIEWED.

BRICKS AND BRICK-MAKING.—The history of bricks is one of the greatest antiquity; in fact it is as remote as the age succeeding the Deluge, and how much older their origin is, it is impossible to say. Certain it is that they composed the Tower of Babel, as well as the early structures of Egypt.

They were made of three sizes by the Greeks and Romans: Those of the latter people are to be seen now eighteen inches by twelve, and from four to six inches thick. But, the smaller forms, decreasing as they did, to the dimensions of those of the present day, were always preferable for their strength. There is a difference between the sizes of brick in England and in this country. The English brick is nine inches by four and a half inches, and three inches thick; whereas the proportions in the United States are generally eight inches by four inches, and in thickness two and two-thirds inches. The Philadelphia brick is a compromise between these proportions. It is eight and a half inches long, four and a quarter broad, and two and a half inches thick. Bricks have been made by hand for centuries on centuries; a strange fact considering the immense requisition the article is in. Yet, it is even so, that the introduction of brick-making machines dates not back thirty years. Since the first practical machine was set to work a goodly number have claimed the public attention; making prodigious promises. But almost all have failed in something or other. We feel desirous of bringing out the merits of any that are really good, and to that end have resolved to publish notices of such; beginning now with that called *THE CHAMPION OF THE WEST*, patented August 22d, 1865, by Molds, patented March 13th, 1866. This simple, yet excellent machine will turn out 15,000 bricks per day, with the labor of five men and one horse. It

makes them equal to pressed brick; and withal is strictly economic, as well as perfect and substantial. If any of our friends are disposed to try the "*Champion*," we refer them to the manufacturer for this State, Mr. J. L. HANNA, of Franklin, Pa.

PATENT PERMUTATION LOCK.

BY ALFRED A. OAT.*

WE were gratified, the other day, with an inspection of this complete lock, and a full description by the ingenious inventor and patentee.

From the earliest appearance of locks to the present, there seems to have been but one principle—that of ward and tumbler—used by the commercial world. Resolutely turning away from this principle, after long and severe study, Mr. OAT has invented a lock without any ward or tumbler, throwing from all sides any number of bolts required. He himself describes it without keyhole, or key, but this is not strictly correct. The lock has an aperture of entrance—closed by a piece of steel, which requires a powerful horse-shoe magnet to withdraw—and this, of course, is a keyhole; and, this being uncovered, an instrument resembling a very short-shafted plumber's or gasfitter's pavement-key or "T," is inserted, and, this is really a key, because designed to complete a circuit, and allow the reversal of the fastening-combination. But, with all this, there is nothing resembling any ordinary key, or keyhole; and the lock is constitutionally different from any thing of the kind ever offered to the public. It can be made of any shape and size, is adapted to safes, vaults, front-doors of dwellings, &c., being both burglar and powder proof. It is set in, flush with the surface of the door, and, when closed, presents no projection whatever. Along

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with all these good qualities, it is of such a nature, that, unlike other fine locks, it is not liable to get out of order by use. It is susceptible of innumerable combinations.

The inventor has testimonials from the Master Machinist of the United States Mint, and many eminent practical mechanics in his branch.

FOREIGN ITEMS.

The newly-built American Methodist Mission Institute at Frankfort-on-the-Main was dedicated on Sunday, the 17th of January, 1869. It is to be under the charge of the Rev. Drs. Hirst and Nippert, and Bishop Jacoby. The Rev. Dr. Cramer, brother-in-law of General Grant, is expected to be present. Dr. Cramer is U. S. Consul at Leipsic. This institution has been founded through the liberality of T. T. Martin, Esq., of Brooklyn, N. Y., who has devoted about 250,000fr. to put up the edifice. It is a large three-story brick building, beautifully situated by the river Main, and commanding a fine view of the country about Frankfort.

In the short gallery at the South Kensington Museum may now be seen the Townshend bequest of pictures to the nation. Several important pictures are to be found in this collection, the most noticeable by far being the "Upas, or Poison-tree of Java," the celebrated composition painted by P. Danby, in the year 1820. This is a highly characteristic specimen of Mr. Danby's poetical mind, and is admirably true in all the details of the subject.

The subscriptions for the statue to Voltaire in Paris amount to 35,909fr., which is considered sufficient. The model selected is that of Houdon enlarged, and the site promised by the authorities has been fixed at the end of the Rue de Rennes, nearest to the Institute. The idea of the statue was first started by the late M. Havin, chief editor of the *Siecle*.

Evening Schools of Art, fifty in number, with upwards of 4,000 pupils, are maintained in Paris. Prizes for proficiency are given by the municipal authorities, and, where the skill of the pupil is very remarkable, rewards are bestowed by the Emperor.

PUBLICATIONS RECEIVED.

VAN NOSTRAND'S ECLECTIC.—We have received the first number of this new Engineering Magazine, and hail it as a very useful aid to information on the great and extensive subject it gleams from. In an energetic nation, such as ours, every man is concerned in the enlargement of thought, and the propagandism of invention. If there is a new idea in science the whole land should know it. Not a hint should be lost for want of the means of communicating it broadcast. Therefore, we say we hail VAN NOSTRAND'S ECLECTIC with pleasure, for we know its mission to be an useful one; and, judging from the sample we have in this first number, we doubt not that its selecting and critical condensing power will give to the community the very cream of useful engineering science. It presents an octavo form of 96 pages of double column, close matter, clearly printed on good paper. New York is its place of birth, and its office is 192 Broadway.

STABLE FIXTURES, &c.—The specimen books put forth by the great manufacturers of iron and other materials, and distributed gratuitously, are something to delight the eye of the connoisseur and the artist. We have been put in possession of several of them, both European and American, and without any undue admiration for those of our own ilk, we must conscientiously say, that the

Specimen Book of Articles now on exhibition at the Ware-rooms of Messrs. J. L. JACKSON & BROTHER, is incomparable for the artistic execution of the engravings, and the elegant style in which they are printed on tint. The designs throughout are such as to draw forth admiration; the illustrations of them cannot fail to fix it permanently.

COLMAN'S RURAL WORLD.—We have received several numbers of this really excellent farming journal, which cleverly holds its own amid the crowd of publications of a similar character in the Great West. Missouri is a vast agricultural State; and its importance in this respect is increasing wonderfully. We are, therefore, glad to see St. Louis sending forth an aid to information so likely to disseminate practical science broadcast, as the RURAL WORLD has for many years done, and we hope for an indefinite term may continue so thoroughly to do.

THE CANADIAN BUILDER.—We are favored with the initial number of this enterprise, which has London, Ontario, for its place of birth. We wish it every success.

THE GARDENER'S MONTHLY.—This useful little serial grows, blossoms and flourishes as it should do under the nursery care of its practical editor, Mr. THOMAS MEERAN.

THE
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AND
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MONTHLY REVIEW.

ARCHITECTURE IN AMERICA:

NAISSANT AND RENAISSANT.

IT is one of the singular phases in the history of this world of ours, that, whilst it rolls on through gathering years, its youthful growth is still perennially made manifest, in the ever advancing power of intellect, which it puts forth. Every age has its wonders; yet those wonders never cease; but rather multiply; and nothing is more surprising, than the narrow-mindedness of that age, which acknowledged but seven wonders in the world. To the senses of childhood, each thing looked upon, heard, or felt, is wonderful, until something still more attractive claims its place, and draws away the attention. We are all children in this respect; and the world is ever holding us in this fairy-like enchantment, by never ceasing its allurements for us to wonder as we go.

Nature grows her facts of animal and vegetable life; and MAN, that most wonderful production of ALMIGHTY POWER, vies with Nature in the struggle to be wonderful. Man has the advantage; for, he borrows thoughts from Nature; and surpasses her with her own materials. INTELLECT is the weapon he wields; and all goes down before it!

Nor is it in ages only, that wonders

are produced. They multiply and increase so rapidly, that years and even days, or hours, are sufficient to develop them.

In Art and Science, we find those wonders classified; and, as the restless Intellect ponders on their history, another hint is borrowed, and another; until, teeming forth, come wonders still, to distance all of these.

ARCHITECTURE, venerable with ages of honor, yet holds a prominent position in the progress of the world; and puts forth, ever and anon, new claims to attention. So will it still continue to do, as long as mind controls matter, and Science gives food to sustain that mind, which grows stronger and more productive, transmitting its efforts to ever coming ages, that, in their turn, add their progressive proportion of that tribute, which, though constantly paid to fame, is still for ever due.

Nature lends her mineral wealth; and the Architect turns it to account, in every way he can. Thus we see the metals, wrought out to be subservient to his art, becoming more and more attractive, and still improving, the more they are improved.

He is not an old man, who remembers when iron was used in building, as a mere accessory to strength, in the shape of *key-bolts, straps, stirrups, kneelers, and suspension-rods*, in carpentry; and *anchors*, in masonry, which attached the wall to the flooring-joists, either to uphold the former, or to retain the latter in durance vile—in case of destruction by fire—to drag down the wall, in one common ruin. But those were the days, when comparatively little was thought of, save drudgingly practising, over again, the simple lessons, which foregoing builders taught.

Iron, however, began to develop its capabilities, under the magic of scientific study. The coöperative power of steam has enlarged the field of effort; and stimulated science to so great an extent, that man may well ponder, in surprise, at the advancement made; and look back, with amused incredulity, at the past greatness of *Timber*; and the good old times when the "giants of the forest" held undisputed sway over the Art of Building.

But, to play the conqueror, and usurp the throne, through so many misty ages held by *Timber*, was not all that ambitious *Iron* aimed at. No! the very styles of Architecture were made subservient to the new ruler; and *Iron* became so pliant a servant of the Architect, that, with economy not hitherto dreamed of, the scope for design was apparently without limit.

The lessons inculcated in this new reign were quickly improved upon; and *Stone* began, under the mastery of the Sculptor, to assert its claims to higher art. Where now is *Timber*? Ah, how circumscribed is that once proud oligarch's dominion! Who would dream, to-day, of working the "orders" in wood? While *lead* has proved the tough old monarch's best friend; and shields his greatness from the derision of Time, and the inquisitive rudeness of the elements.

The world has rolled into another age of wonders: Science stirs up the cal-

dron, and throws in new ingredients. Man looks on all, delighted, but prepares his mind for more, and

"Still they come."

The French architects have long had the advantage of the quarries of Montmartre, near Paris, which yields them a beautiful fossil stone, so easily tooled, that it is commonly set in the wall, and there chiseled by the workman, who, now and again, descends from the scaffold, to view the effect of his work.

The English architects have had the Portland Stone, to work upon, which presents every facility, while fresh; and ultimately hardens to an acceptable degree.

American architects have not had a stone so pliable, as those; but the marble has been worked, notwithstanding, to good purpose. However, to incur, for most domestic purposes, the cost of carving it to the degree, that French, or English works display, would be extravagance. In this position, we stood, then, in reference to our British and Gallic contemporaries, up to a comparatively recent day, when Cast-Iron presented all the ease of embellishment, which the most luxuriant imagination could possibly design.

This discovery, or rather development, of the capabilities of the great mineral of the age, at once threw open the gates of American Architecture to the flood of novelty, which, as it were, burst upon it from Europe, in the *Mediæval, Cinque cento, Louis Quatorze*, and a number of other-named styles, which had mouldered, through long silent time, unnoticed, save to be sneered at, in the heterogeneous buildings of the South of Europe. This, then, is the age of *Renaissance*, or second birth, of such styles in Architecture; and *Palladio* lives again among us.

What succeeding ages will think of our Architecture, is a question which we are quite unfitted to answer, even by a "guess;" for, so habituated does the eye

become, to the style regnant, that we fancy graces, where we might hereafter see defects.

Let us look back at the days when Greek and Roman temples reigned, in wooden grandeur, over the land. When Justice and Cloacina appeared in the one garb;—and who then would have thought of questioning the classic taste that willed it so? How do we judge such a state of taste just now? And how shall we have our vaunted efforts ridiculed, perhaps, by as unfeeling critics in the future, as we are in the present!

There is much, that we can study over, in our styles of to-day, which may give us some idea of how we actually stand, in reference to true taste; for, that sentiment is founded on immutable laws; and that it is so, we should feel thankful; because nothing, save a breach of those laws, can ever permit us to wander far from the truth; and, should we so stray, a consideration of those laws will surely lead us back again to the point, from whence we deviated.

The laws we allude to, are founded on common sense; and, therefore, cannot lead us into error, by adhering to them.

That the *Renaissance* is open to a vast deal of cavil, there is no doubt; for it will not stand the test of close investigation, tried by those laws. So that, although we have gained much, by the adaptability of iron to ornamental architecture, we have, through its means, run riot in the field of taste; and, in endeavoring to outdo the past, have very likely, subjected the present, to a charge of absurdity.

In fact, we have suffered our Art to become a mere vehicle of whim; a thing of Fashion, to be enjoyed for a season, like a lady's bonnet, and then be set aside for some newer fangle, which may become popular, not on account of its intrinsic merit, but by reason of mere novelty. For, it is, unfortunately, the fact, that our most sensible architects are compelled to follow in the track of

the triumphal car of Fashion, or linger idly by the wayside. *De necessitate*, our professional brethren—while deploring the rule under which they have to act—

“For those who live so please,
Must please to live”—

yield to the necessity, and go forward with the rest.

But, while we seemingly acquiesce in this state of false sentiment, into which our art-age appears to have lapsed, would it not be desirable to forget our foreign standard-bearers; and struggle, on our own account, for the true issue? If our European models are not alive to the requirements of true taste and sound judgment, why should American architects be so devoid of national feeling, as to forego their own opinions; and yield to those of others? We see no reason for such a state of things.

That there is much that is beautiful in the *Renaissance*, we will not pretend to deny; but, that there is much that is frivolous, puerile, and wholly unworthy of a solid, simple Republic, such as ours, we stoutly aver. The gaudy frippery, that glitters round a throne, is out of place in our atmosphere; and whilst we mirror the fashion as it is, we feel free to question the sense of it; for, its presence is oftentimes in direct antagonism with the laws, by which sound Architectural Design is governed.

The truth is, and we shrink not to declare it, that our brethren, on this Continent, do not exert their native independence, nor exercise their inventive taste, which (in view of those laws, that should never be infringed) would give them character, at home and abroad.

Is there any reason, why American architects should be no more than copyists of European models? We think not. They would, undoubtedly, be more respected by the age they live in, as well as by ages yet to come, if their works carried more the stamp of originality, in fact, were truly American, un-

reflected from the other side of the water.

When sailing up the Hudson, during her visit to this country, Miss Bremer had her attention called to a pigmy edifice on the shore, which she was told, represented, on a small scale, one of those baronial castles on the Rhine. To which she quietly replied, "a very small scale, indeed." How ridiculous, then, must be the figure our "palatial" efforts present to the eyes of reflecting Europeans, accustomed, as they must be, to structures on a scale, which would be quite uncalled for in this country.

The time must come, sooner or later, (and why not now?) when an original American style must be born of the National genius. This will be our *Naisant* style which would be *of* the country, as well as *for* the country. It will be subject to our peculiar climate; not requiring the ponderous walls, so depressive of taste, which the stormy lands, whence we now borrow ideas, are compelled to construct.

The astonishing clearness of our atmosphere, giving us so great an altitude of zenith, is an advantage our architects possess, which belongs, besides, but to Italy, or the Orient, in the older world. Here, then, may the art of our professional find ample scope, for the fullest development of the poetry that is in him. And in a region so boundless, that the sun's course, across it, marks a semicircle, surely there is plentiful room for fancy.

We allow all possible credit to the architects of England and France, as well as the rest of Europe, for what they have done, and are now doing. But their position, in reference to architecture, is very different from ours, in many respects. Their taste must, more or less, be governed by the institutions they live under, and the demand upon them, to keep alive, in their works, the history of past ages. The American Architect has no such nightmare on his shoulders. To him the past is as noth-

ing to the mighty FUTURE. He feels, or should feel, that he has a nationality, in his ideas, alone. His thoughts are unchained by the commands of rulers; and his true patron is the public, whose favor he must win, but whose widespread liberal opinion is more worthy of his best effort, than the single sanction of any emperor, or king, upon this earth.

In our *Naisant* style we would be governed altogether by the fitness of design. Its fitness for the purpose for which it is to be erected. Its fitness for the locality, where it is to stand. Its fitness in the material chosen, not alone as regards strength and durability, but with respect to color also. The fitness of ornamentation is a feature of our *Naisant* style, which should be especially attended to. Let us have no leaves, or flowers, that belong not to our soil; no animals, that never had an existence, such as griffins, dragons, and the like. None of these. Let every thing be American, in feeling and effect. Such is our idea of what a National style ought to be.

Let us consider the possibility of such a consummation as this most desirable one. We hope no American Architect thinks it impossible. Already we have enlarged on many things in Domestic Architecture, and no one will doubt the prevalence of an American style in this department of the art.

In our public buildings, civil and ecclesiastical, the grand effort must be made. It was something of a relief to the eye, wearied with the ever-recurring Roman and Grecian styles, in our jails, court-houses, custom-houses, banks, and public halls, to see the modernizing of the Venetian, Italian, and Romanesque styles occasionally showing themselves, and attracting, by their novelty, more, than by their intrinsic worth. In our churches, we see the modernized Gothic, the Norman, and the Romanesque, with an occasional Byzantine effort, as at New York and Baltimore. But all these fail to meet the end we seek; for, they

are, every one, slavish copies of European parts of buildings, erected by either a barbarous or semi-barbarous people, whose architects held exclusively the knowledge of geometric art, and turned and twisted it into designs, without any apparent object, save to excite wonder at their ingenuity. No doubt, the crude ideas, first put into shape, were afterwards made use of, and vastly improved upon, by succeeding ages. And here we would call attention to this evident fact, that those semi-barbarous architects were the authors of the *Naissant* styles of their day, which have held their place in the world, for so many centuries; and have yet unlimited admirers.

Does the American Architect feel nervous, as to his ability to originate, after such examples; and, with the world of accumulated information, that he has in ably-edited books and accurate engravings—such as no other profession can boast of—to aid him in his glorious task?

Without any knowledge, whatever, from the outside world, the Chinese and Japanese formed their national styles; which, however we may jeer at them, were nevertheless perfectly original, and unquestionably national. Far away in the remotest countries on the globe, we find styles unlike any thing we ever saw; and, taking as an example the public buildings of Hindostan, where can we find more striking proofs, of the individuality of architectural genius, than are to be found there? True, it is not *classic*, this Hindoo style, yet, it has its charms for that people; aye, and features of elegance for any taste, however refined, to dwell upon, with pleasure. Their architects, no doubt, borrowed ideas from Nature; and what more bounteous treasury to use? All the earliest peoples, evidently, did so. Why should our American Architects not borrow from such a prolific source? There is one good and substantial reason for our present conglomerate of archi-

ture. Our nation is made up of many different nationalities, whose architects, coming to this country, bring with them the ideas of design, prevalent in their respective lands; and, not alone that, but they keep up those early teachings, by importing their country's architectural books and engravings. English and American Architects have taken the publications with which London can so liberally supply them. We have long wanted an independent source of information and channel of free intercourse, amongst our American brethren; and now, it is here, we hope to see it used, by contributors freely, and with a patriotic view of advancing the interests of AMERICAN ARCHITECTURE.

The public will take a growing interest in this matter; and will expect to hear from our professional friends on the subject. Let it, at least, be fully and exhaustively canvassed.

All our architects, of every clime, will join in this national movement; for, no foreigners, as a body, hold the institutions they have left, in such regard, as to desire their memory to be perpetuated in the architecture of this land of their redemption. They simply accept this importation of old-time thoughts, for the reason, that there are no pure architectural features native to this country of their adoption.

Even when we used the Greek and Roman styles, we held a more independent course, than we do, under the reign of the *Renaissance*; for, those styles are, as it were, a dead language, and do not convey any unpleasing reminiscence of a still living oppression. The beauties of those styles are unquestionable; and it is their features, which we cherish, without any reference to the long-dead history of their age. As entire models we cannot favor them, for their darkness, owing to not having windows, cannot accord with the flood of light, which our buildings demand. But, we would, most decidedly, favor the retention of those time-tried members of the classic

styles, which can be made consonant with our own national composition. In the formation of the DESIRED STYLE, then, the perfection, which we should, of course seek, would be a distinct creation, in which the members, we allude

to, would be subservient to the grand whole. A treatment, in short, so unmistakeably original, as to take rank among those of the other nations of the world, and be acknowledged by them, as, *pre-eminently*, THE AMERICAN STYLE.

THE MINSTERS OF ENGLAND.

HAVING reviewed the detail beauties and historic glories of Notre Dame de Paris, we return to the architectural treasures of England, to gaze, with our readers, on that exquisite relic of the solid grandeur of ecclesiastic architecture of days gone by for ever; and to compare, in mingled admiration and sadness, the stupendous work of permanency with the noblest modern cathedrals; whilst we in our day must blush to feel, that, with all the acquisitions of scientific knowledge which we possess, our buildings, however choice in style, and elegant in execution, are not likely to reach as far down into the future, as the artistic beauties, we wonder at, date back into the far, far distant past. There is a melancholy pleasure in contemplating those petrified visions of religious zeal, which have left a national blessing on the land that they adorn; however different may be the creeds of to-day from that by whose influence they were called, in the past, into existence.

Amongst the very interesting Minsters of England, which cannot but draw the attention of our readers, remarkable in the first rank stands that which we will now describe:

WESTMINSTER ABBEY.

The architectural design and the skilful arrangement of this celebrated edifice, the scientific and ingenious construction of its walls, arches, vaultings, and nicely-poised and balanced parts, are all entitled to the most diligent study of the practical architect; and

will afford both amusement and instruction to the antiquary and amateur. It will be proper, always to bear in mind the common adage of "sound as church work," and to remember that this maxim was founded on observation and reflection. The length of time which most of those cathedrals and larger churches have braved the inclemency of an ever-changing climate, such as that of England, the neglect of their guardians, and the wanton injury inflicted on them by fanatics and heedless persons, is a lasting proof of the skill with which they were constructed.

The Abbey Church of Westminster is one of the finest examples of the pointed style, that was ever erected in any age or country. It is, at this day, in a state of perfection wonderful to behold, after such a term of existence as it can claim.

Its general form is that of the Latin cross; but the eastern part, from the transept, is surrounded by various chapels, which interiorly are separated from the aisles by ornamental screens of a later age.

THE EXTERIOR

measures: Extreme length, 416 feet; ditto, including Henry's Chapel, 530 feet; height of western towers, to the top of pinnacles, 225 feet 4 inches. The dimensions of the cloisters, chapter-house, and other monastic buildings, it is unnecessary to give; the main measurement being sufficient for our purpose.

THE INTERIOR

has the following dimensions: Length of nave, 166 feet; breadth, 38 feet 7

inches; height, 101 feet 8 inches; breadth of each aisle, 16 feet 7 inches; extreme breadth across the nave and aisles, 71 feet 9 inches; length of choir, 155 feet 9 inches; extreme breadth of ditto, 38 feet 4 inches; height, 101 feet 2 inches; breadth of the middle part of transept, 39 feet; ditto of the aisles, 22 feet 10 inches; height of transept, 105 feet 5 inches; extreme length, from west door to the piers of Henry VII's Chapel, 383 feet; ditto, including Henry's Chapel, 511 feet 6 inches. The South Transept is what has obtained the honorable and unique title of the "Poet's Corner."

The North Front was, in ancient times, the principal entrance to the church; and all the stately processions, and pompous trains assembled to grace the coronations, the thanksgivings, and the burials of the sovereigns of England, were ushered beneath its porch to give interest and effect to the solemnities within.

This front consists of such a considerable variety of parts, that it becomes difficult to describe it, with any thing approaching accuracy, in the limits necessarily assigned to the subject, in the pages of our REVIEW.

Four immense buttresses, which, from their workmanship and disposition, are rendered very ornamental, sustain the walls; their several gradatory stages being sculptured into cinque-foil-headed niches, &c., and each buttress being terminated by an octagonal pinnacle, of which every face is wrought with a trefoil-headed paneling, between small columns; a similar, but lesser pinnacle, rises over the apex of the roof; and is crowned with a small vane, as all the pinnacles were formerly. The corner buttresses form irregular octagons, including staircases, which are carried up to the roof, through the great arch-buttresses that extend across the side-aisles. This façade may be described, as consisting, vertically, of four compartments, the lowermost of which in-

cludes the three entrance-porches. The central porch opens by a very high-pointed arch, forming a deep recess, its archivolt being supported on each side by five slender columns, having capitals of rich foliage. The flat wall, at the back of the arch—over the two doorways, which are separated by a plain, upright pier—is nearly filled by a circle of paneling, including twelve other circles, variously adorned; in the central one are the arms of St. Edward the Confessor, or, in simple laic, King Edward, that Saxon monarch, who willed his kingdom to William of Normandy, in right of which legacy, the lawful King Harold was overcome and killed in battle, whilst the Norman took possession, under the acknowledged title of William the Conqueror. Three clustered columns on each side similarly ornamented, but larger than those before mentioned, sustain all the outer mouldings of this porch, except the extreme moulding, or water-table, which continues round both the smaller porches, as well as over the arcade of trefoil arches between them and at the sides. A large finial, of congregated foliage, crowns the apex of this front. All the outward mouldings of these porches contract inwardly at the springing of the great arches, from the circles having been struck at some distance above the imposts. A trefoil-headed paneling extends along the whole upper part of this division, which is terminated by a range of pierced cinque-foil arches and a plain parapet. The next compartment consists of four wide and obtusely-pointed arches, above which is an arcade of eleven pointed arches, surmounted by a perforated battlement: the obtuse arches form deep recesses, extending to the windows. The arcade arches are well proportioned, the mouldings spring from light, clustered shafts, and each arch is divided into two others, having trefoil heads, by a small column; within the space above is a circle enclosing a cinque-foil. The third compartment in-

cludes the great Rose, or Catherine-wheel window, which was rebuilt in the year 1722. This elegantly-constructed ornament consists of a vast circle, divided by its tracery into a small eight-leaved concentric circle, from which expand sixteen trefoil-headed leaves, forming the lower divisions of a similar number of large pointed leaves, which extend to the extremity: open trefoils ornament the spaces between the larger leaves; and the spandrels, which complete the design, are each filled with a small rose of six divisions, and trefoil-headed leaves. A paneling of sunk quatre-foils enriches the parapet of this division. The last compartment, which extends to the apex of the roof, is occupied by a handsome arrangement of paneled arches, at bottom; and three circles, a trefoil, and other sculptured work, above. The arch-buttresses at the sides, which spring from the great octagonal buttresses, have sunk trefoil-headed panels, and angular weatherings. The entire height of this front, to the top of the central pinnacle, is 170 feet. The east and west sides of this transept are nearly similar, each being separated by graduated buttresses, into three divisions containing the windows. The piers, which rise from the angle of the aisle-battlements, and sustain the arch-buttresses, are duplicated in a peculiar manner. The large pointed windows are each divided, by a mullion, into two principal lights, over which are circles of six divisions, and smaller lights in the angles. The second tier of windows may be regarded as of a peculiar character; their general form being that of a spherical triangle, enclosing a large circle, within which are eight lesser circular divisions, besides a central one. This mode of construction is general in all the side windows, on the same story, in both parts of the transept; and also, with four exceptions only, in all the chapels eastward of the transept.

The walls between the transept and the west front are supported by nine

graduated buttresses, terminating pyramidically; and from these a two-fold range of arched, or flying buttresses, extend to the upper part of the nave. The parapet of the clerestory is surmounted by a battlement, nearly level with which there is a turreted niche in each buttress: the four westernmost niches contain the statues of Abbot Islip, James I, and, probably, Henry III and Edward the Confessor; but the whole are much damaged.

Between every two buttresses, in the lower story, is a large pointed-arched window, of two compartments below and circular and quatre-foil lights, &c., at the top.

Another range of windows, each consisting of three circles, inscribed within a triangle, extends over the former range, and rises to the water-tables of the aisle parapets. Another range, corresponding with those first described, but not so high, admits light into the upper parts of the nave. An embattled parapet terminates the elevation.

The Choir aisles are surrounded by six chapels, viz.: three on each side, independently of Henry VII's Chapel, which forms the eastern termination of the entire pile. These chapels are of the same era as the oldest part of the fabric, and the architecture is of similar character, except that of Abbot Islip, which adjoins to the northeast side of the transept, and was altered into its present style in the reign of the above sovereign. The four largest chapels project octagonally, and rise to the same height as the battlements of the aisles. The eastern termination of the church itself, as seen over the chapels, displays four windows on each side, and three at the end, which finishes in a half-decagon; these windows are more acutely pointed than those of the upper range already described, but are of similar character and arrangement.

The southern division of the transept, it must be remarked, has a far less elegant façade, or front, than that of the

opposite extremity; but the library, chapter-house, and cloisters, being immediately contiguous, the lower part is excluded from view. It is supported by four vast buttresses, each terminating in a plain octagon tower, crowned by a ball. All the lower part is occupied by the Chapel of St. Blaize, or St. Catharine, which is now used as a vestry. The wall immediately over this chapel is pierced by a range of six narrow pointed windows, above which are three large windows, divided into two lights below, and having a circular light in the head; the exterior masonry of all these windows is modern, and wholly unornamented. The next compartment displays the great rose, or marigold window, which was constructed, about the year 1814, by Mr. Thomas Gayfere, the Abbey mason, under the superintendence of Benjamin Wyatt, Esq. All the ancient forms were preserved in the rebuilding, by working from the original parts; but the latter, if the report made to Bishop Atterbury by Sir Christopher Wren, be in this instance correct, could not have been of any great age, for he mentions this window, as having been "well rebuilt," about forty years before the date of his report, which was drawn up in 1713. The centre is formed by a small circle, including a quatre-foil, within which is the date, 1814; from this sixteen large leaves extend to the periphery; each being sub-divided into a double range of cinque-foil lights in the upper part, and a single range below. In the head of every leaf is a quatre-foil, with smaller lights; and in the angles between them are trefoils. The spandrels on the outer part of the great circle are occupied by small circles, including quatre-foils, with cinque-foil leaves at the sides. A frieze, charged with grotesque animals and human heads, ranges over the window, and above that appears the high-pitched gable-end of the roof. Between the two westernmost buttresses a deep and strong, semicircular arch expands over

the east wall of the cloisters, and has been supposed to constitute a part of the church erected by King Edward the Confessor.

Some singular, but ingenious peculiarities, arising from the contiguity of the cloisters, are observable on the south side of this edifice; these arose from the means necessary to be employed to sustain the walls, and, at the same time, to admit the intervention of such a considerable space as the breadth of the cloisters, between the superstructure and the abutments. The first six buttresses westward from the transept have their bases within the cloister green, and are each connected with the walls of the church by four arch-buttresses of considerable magnitude, the uppermost of which extends across the aisle. The three other buttresses adjoin the wall like those on the north side; and, like those also, all the buttresses are graduated, but these are unornamented, and without niches.

The West Front consists of a central façade, in the pointed style, flanked by two anomalous square towers, the modern parts of which were designed by Sir Christopher Wren, and carried to their present height of 225 feet, in the early part of the last century. In the middle of the façade is a deeply-recessed central porch, with a vaulted and ribbed roof, but the ribs are greatly decayed and mutilated. The walls, which gradually contract to the doorway, are wrought into compartments of paneled tracery. Two blank shields, projecting from sunk panels, with a large niche and pedestal over them, ornament each side of the porch. The space above the great arch is filled by ten other niches, separated by small buttresses, and terminating in cone-shaped canopies, truncated. Over the latter is a modern cantilever cornice; and between that and the parapet projecting before the great west window is a frieze, enriched with various shields of royal arms. The great window is admirably proportioned, and its

tracery, though not complicated, is yet elegant. It is divided into twenty-four large and fourteen small compartments, by two principal and four inferior mullions, and four transoms. All these divisions are filled with painted glass, of brilliant coloring. On each side are three compartments of paneled tracery, and over the window is a very heavy cornice. The frieze is thus inscribed, in reference to its front: "A. R. GEORGE II. VIII. MDCCXXXV." In the gable of the roof is a small triangular window, with tracery. The piers, adjoining the entrance porch, which partly sustain the towers, are supported by massive buttresses, the several stages are ornamented with canopied niches. The flanking towers may be described as being each divided into two nearly equal parts by a Tuscan cornice. In the lower division are painted windows, with blank arches over them, including quatre-foils and circles; and above the latter is a second range of pointed windows, latticed, which ascend to the cornice. Immediately over the cornice, on each side, is a Roman pediment, with enrichments, below which, in the north tower, are the black dials. Latticed windows, of a mixed character, rise above the pediments, and, with their surmounting scroll-work and paneling, extend to the cornices beneath the parapets, which are pierced and embattled. The pinnacles, which crown the whole at the angles, are octagonal, and terminate in finials wrought like fir-apples; at their bases are ornamental trusses inverted. The side divisions of each face, in both towers, project beyond the central parts, and are sculptured into successive ranges of paneling.

It must be obvious to every one, that there is a discord here, the presence of which is attributable to Sir Christopher Wren, who completed the towers; and, ever anxious to bring in his favorite ideas of classicism, perpetrated this glaring blunder.

On entering the venerable edifice from

the west, the interior produces a most striking and impressive effect; the view from that point being more extended and unbroken; and the architectural character of the design more apparent, than from any other. The lights, too, are so happily introduced, and the arrangements and proportions of the columns so nicely adjusted to the forms and magnitude of the arches, and to the aerial loftiness of the vaulting, that the whole combines into one harmonious perfection; and, for a time, the spectator feels a stronger inclination to contemplate the picture, than to examine the building.

Decidedly the most superb feature of this holy edifice is the main vaulting, which has been truly characterized as a prodigy of art; profound geometrical knowledge being here combined with the utmost practical science, and the power of gravity effectually counteracted by professional skill. It consists of two principal divisions, viz.: that of the nave, and that of the east end. The tracery, pendent decorations, and other ornaments are without a single parallel in architecture. It is entirely of stone, and of great solidity, though appearing to hang in air with graceful lightness, being overspread with sculpture, like a web of exuberantly and elegantly wrought network.

The history of this exquisite temple of Christian worship, and vast mausoleum of the mighty dead, is one well worthy of its surprising beauty and grandeur. As the kingly oak springs from the humble acorn, so this princely pile grew up to its greatness from the diminutive monastery on *Thorney Island*, as Westminster was then called, it having been "overgrown with thorns, and environed with water." Until the time of Edward the Confessor, it was very inconsiderable; but that monarch, taking a fancy to have himself buried there, bestowed all his royal patronage upon it. The cause, it is said, of King Edward thus patronizing this little monas-

tery, then known as St. Peter's, was his breach of a vow, which he had made, of going on a pilgrimage to Rome. He despatched a solemn embassy to the Pope, to crave a dispensation, which the pontiff granted to him, under the "obligations of holy obedience and penance, that he should give a part of the money, allotted for his journey, to the poor; and, with the remainder, either repair or erect a monastery, and furnish the brethren with a revenue and sufficient necessaries."

The king appropriated "a tenth part of his entire substance to the work, as well in gold, silver, and cattle, as in all his other possessions."

The new church was in the form of a cross, and was many years in course of construction. On its completion, Edward resolved to have it dedicated in the most solemn and impressive manner, the ceremony being appointed for the day of the Holy Innocents, December

28th, A. D. 1065. All the prelates and great men of the kingdom were present on the occasion. Edward died on the 5th of January following; and was canonized, eighty years after, by Pope Alexander III, under the name of St. Edward the Confessor.

Henry III, and Edward his son, carried on the building to a greater extent, and the latter monarch caused, in 1297, the famous prophetic stone on which the Scottish kings were crowned, to be brought from Scone, and placed under the coronation chair in this church; and here the royal rulers of England, from James I, heirs of the Scotch throne, have, ever since, received the crown, sitting in this chair and above that stone, from the time of Edward II. to Victoria.

Thus we see, in this story of Westminster Abbey, the singular fact that a king's penance has produced an architectural wonder, to be for ages a people's pride.

AN ANECDOTE.

THE following little fact will, doubtless, tickle our professional readers, whilst it may serve as an admonition to those who do not think it quite so necessary to call on their services.

"When Mr. Day, author of *Sanford and Merton*, determined to dip his unsullied hands in mortar, he bought, at a stall, Ware's '*Architecture*;' this he read, with persevering assiduity, for three or four weeks, before he began his operations. Masons calling for supplies of various sorts, which had not been suggested in the great book of architecture, annoyed the young builder exceedingly. Sills, lintels, door and window-cases, were wanting before they had been thought of, and the carpenter, to whose presence he had looked forward, but at a distant period, was now summoned, and hastily set to work to keep the masons agoing. Mr. Day was deep in a treatise, written by some

French agriculturalist, when the masons desired to know where he would have the window of the new room on the first floor? He sat immovable in his chair, and gravely demanded of the mason, whether the wall might not be built first, and a place for the window be cut out afterwards. The mason stared at Mr. Day with an expression of the most unfeigned surprise. 'Why, sir, to be sure, it is very possible; but, I believe, sir, it is more common to put in the window-cases while the house is building, and not afterwards.'

"Mr. Day, however, ordered the wall to be built without any opening for windows, leaving the room, which was intended for a dressing-room, for Mrs. Day, without any window whatsoever. When it was sufficiently dry, the room was papered, and for some time candles were lighted in it whenever it was used."

DESCRIPTIONS.

IRON STORE-FRONTS.

BY WM. J. FRYER, JR.*

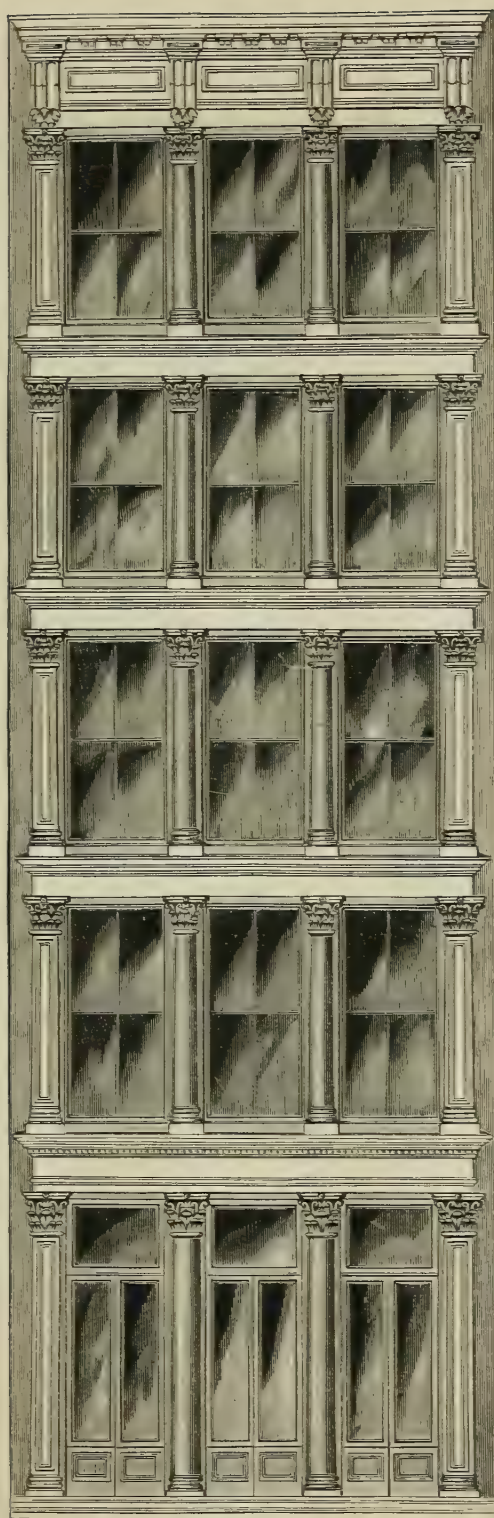
IN the city of New York, there are a greater number of entire cast-iron building fronts, in process of erection, than ever before, at any one period of time. Iron, indeed, has meritoriously secured for itself an almost universal adoption, in this country, for the first story fronts of stores, on account of its durability, strength combined with lightness, and ready renovation. But its use for complete fronts, for a number of years immediately past, has, in comparison with marble and freestone, been small. When, some twenty years ago, iron fronts were introduced, as a novelty, their low price secured a large adoption. But, incorporated with these early attempts were defects which, in due time, secured a general dislike to them. The introducing manufacturers, and architects in iron, acting on the self-evident proposition, that a multiplicity of ornament and decoration could be executed in iron at an expense not to be named in comparison with that of stone, literally covered their fronts with useless filagree work. Every column must be fluted, or of some intricate pattern, every moulding enriched. Wherever a square foot of plain surface revealed itself—that was deemed a legitimate place for elaboration. The carvings high up in the air, on the fifth story, were the same as those low down on the first, no bolder, and in every case too flat and fine. Instead of seeking for beautiful outlines and proportions, and appropriately embellished, special features, to contrast with other portions of the edifice, purposely left plain and unpretending, with iron-workers, ornateness was made the governing idea; and all elaboration,

such as architects previously might have dreamed of, but did not dare represent in their plans, produced, with twistings and contortions of outline and crowding in of small columns and pilasters and diminutive friezes and cornices, overlaying everything with so-called ornament, and planting on miles of reiterated and unmeaning rope mouldings, all this, was presented as embodying the beautiful, and as a thing which would greatly elevate the public taste.

The public were taken by storm. "Why," an iron constructor would say, to a party about to build, "I can furnish you such a front in iron for so many thousand dollars: the same front, in stone, will cost so many thousand dollars. See what a vast saving!" This, together with the enumeration of the fire-proof and other good qualities of iron, were conclusive arguments, to a man who had made his money in fish, or oil, or cotton; and secured an order for a cast-iron front. Immediately after the introduction, the making of iron fronts rose into a business of magnitude and profit. But the pretensions and vulgarity of these over-ornamented fronts, in due time, brought them into well-merited contempt, and sealed their condemnation by every person who had any knowledge at all of what is truthful and comely in architecture.

The fault of these fronts was not in the material employed, but in the false treatment. For building purposes, cast-iron possesses unequalled advantages of strength, durability, economy and adaptability to ornament and decoration. In resisting any kind of strain, it is vastly superior to granite, marble, freestone, or brick. Practically, cast-

* With Messrs. James L. Jackson & Brother, East Twenty-eighth street, New York.



IRON STORE-FRONTS.

By WM. J. FRYER, JR., WITH MESSRS. J. L. JACKSON & BROS., NEW YORK,

iron is crushing-proof, for a column must be ten miles in height, before it will crush itself by its own weight. Unlike wrought-iron and steel, it is not subject to rapid oxidation and decay by exposure to the atmosphere; and whatever tendency it may have in that direction, can easily be prevented by a proper coating of paint. No other material is so valuable, after it has served its original purposes, as it may be re-cast into new forms and adapted to new uses.

In business quarters, where blocks of stores are built up solid, where each building measures about one hundred feet deep by twenty-five wide, rear almost butting to rear, with window openings only at the front and back, light becomes one of the most important requirements. A chaste and airy edifice of iron may be safely substituted for the cumbrous structures of other substances, and ample strength secured, without the exclusion of daylight. Iron, in this respect, presents peculiar fitness. It wants proper treatment, and asks not to be set up as a false jewel, colored and sanded in imitation of stone, or made flashy with over-ornamentation. This material—*emphatically an American building material*—has peculiarities of its own, and will preserve its own individuality. Let an observer stand on any of the four corners of Stewart's immense drygoods store, and take in with his eye the frontage on two streets. Those plain round columns and moulded arches, and projecting cornices cannot be mistaken for stone. There is too much lightness and grace for anything but iron; and both the expansive elevations are beautiful too, in being iron. As another example, take the large iron front just erected on the corner of Eleventh street and Broadway. Or, as a greater marvel of simplicity in iron, with boldness and beauty, the front of Messrs. Cornell, on Centre street. And so of others. Iron fronts have been relieved from the thralldom of ornamentation—over-ornamentation. Stew-

art's store, in this respect, marks a new era in its use.

Whatever moulding is good in stone, for projection, or general outline, is also good in iron. And iron, with its greater daylight openings, and airiness of structure, and smooth surface painted with honest lead and oil paint, will proudly speak for itself. Long after a stone front has gone to decay and disappeared, the iron will be retained in its original fullness and sharpness in every line. Keep it painted; and, after a thousand years of exposure to wind and weather, an iron front will be as perfect as on the day of erection. To paint iron costs much less than to paint wood or other materials, on account of its non-absorbent surface. The *interest* on the difference in first cost, between a stone and an iron front, will easily pay for one coat of paint a year. More than that: allow the difference in cost to accumulate with legal interest, less the expense of one coat of paint a year, and by the time the stone is ruined, the iron will not only have cleared itself, and stand on the balance sheet at a profit, but be in prime condition for continued service.

On any much-travelled street, a marble front soon becomes rusty and discolored with dust and rain. An iron front, kept properly painted, appears periodically in a new dress, and is always clean and bright. Other things being equal, place two merchants respectively in a stone front and an iron front store, side by side, and he in the clean, bright, attractive front will do the most business, and can afford to pay the largest rent. Just above Grace Church, on Broadway, there are two stores erecting, adjoining each other, and precisely alike in every detail, one front of iron and one of marble. These take a place in the history of building fronts.

When iron fronts were first introduced it was strenuously asserted by some, that expansion and contraction would dislocate the joints, and render a building unsafe. An examination of any of

the numerous cast-iron structures, which, for a number of years, have been exposed to every change of atmospheric temperature without, and to the heat of steam-boilers, &c., within, will show everything unchanged: this proves that the temperature of our climate, throughout its utmost range, from the greatest cold to the greatest heat, exerts upon it no appreciable effect. Events have also proven, in the cases of the burning of store-houses, filled with combustible goods, that cast-iron fronts are absolutely fire-proof, and will neither warp, nor crack, nor fall down. Only let it be remembered, that, in addition to a high and intense heat, the use of a blast is required to reduce iron to a molten state; and the ability of iron fronts to withstand fire will be readily understood. They are also perfectly safe during thunder-storms. The metal, presenting so great a mass to the over-charged clouds, becomes a huge conductor in itself, and silently conveys all the electricity to the earth. In them, the intensity current is instantly diffused throughout the entire mass, and changed into a current of quantity, thus obviating all danger from disruptive discharges.

A front of iron can be previously prepared and fitted in the manufactory, and thence safely transported to the place of erection and put together with wonderful rapidity, and at all seasons of the year. It takes up less space than a stone front with brick backing, and so enlarges the interior of a building. When it becomes desirable to tear down the building itself, to make way for other improvements, the iron front may be taken to pieces, without injury to any of its parts, and be re-erected elsewhere, with the same perfection as at first. Instead of destruction, there would be a removal only. In iron, as in other materials, must ever be observed those undeviating laws of proportion, and rules deduced from a refined analysis of what is suitable in the highest degree to the end proposed. There is not a structure

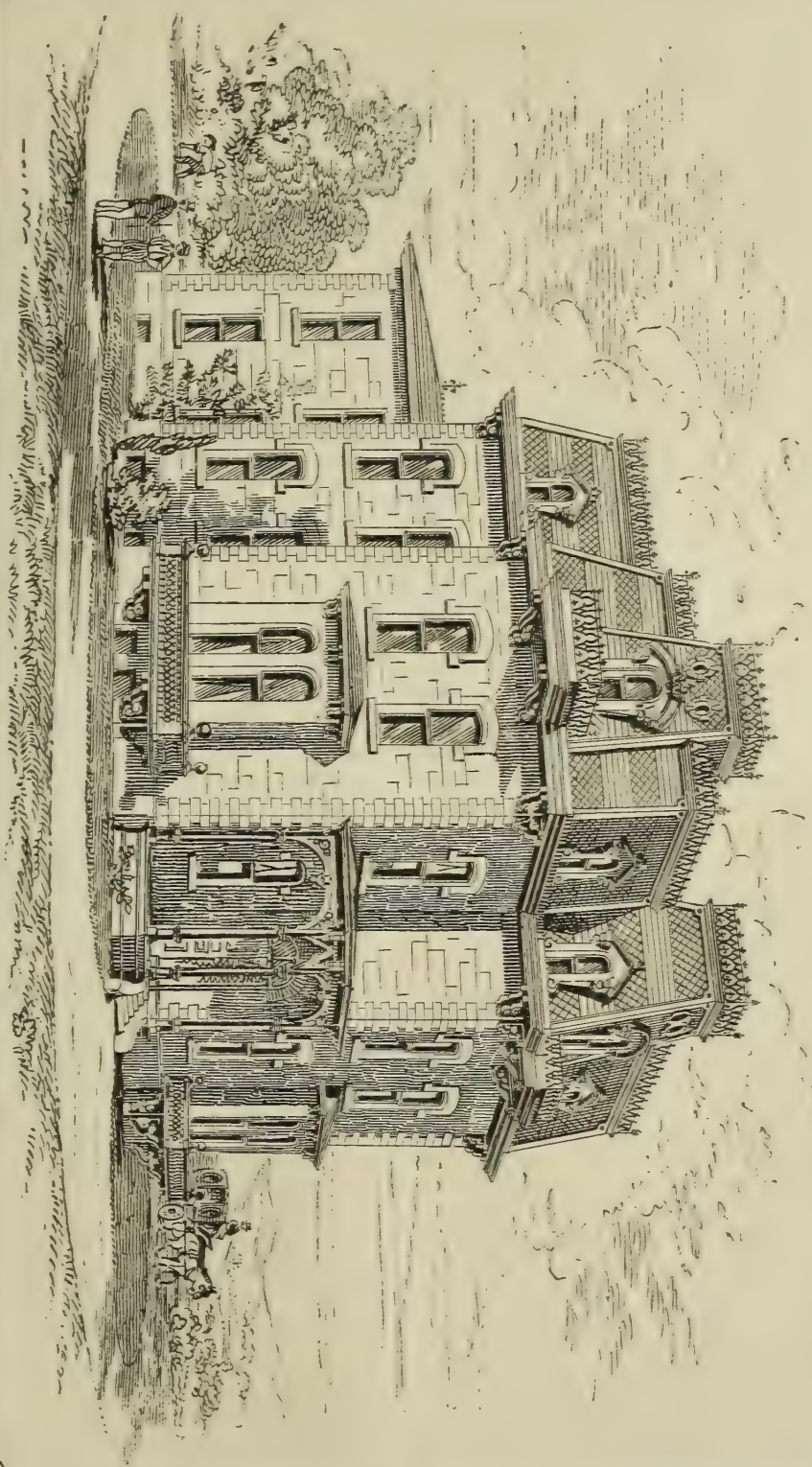
erected anywhere, but adds its quantum to the good or bad impressions to be directly stamped upon the public mind. Thus every one who builds is unwittingly enhancing, or deteriorating, the taste of the masses, and the aggregate result of this is a thing not to be over-estimated. It behooves the general use and careful treatment of a material which allows greater architectural effect, in proportion to the outlay of money, than any other. In our new and growing country, the dollars saved on one building are required for the erection of another, or for use in railroad, or mining, or manufacturing enterprises. It is primarily a duty for every builder, to do the most with his money and the most for art.

Iron has in its favor unequalled advantages of ornament, strength, lightness of structure, facility of erection, durability, economy, incombustibility, and ready renovation. When the public become thoroughly acquainted with the advantages iron possesses, as a building material, it is confidently predicted, by many, that it will be generally employed for superior buildings—for stores, churches, banks, asylums, dwellings, and manifold other structures—in preference to granite, marble, freestone, or brick.

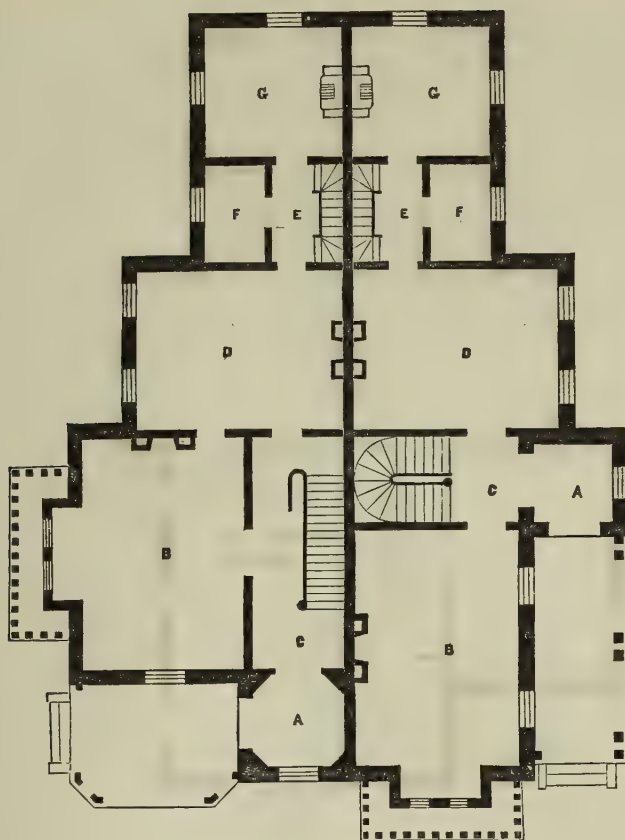
A DOUBLE VILLA:

WITH FRENCH ROOF.

THESE plans, together with the accompanying elevations, are adapted to a design for Two Villas, so arranged, as to represent A Single Building. The outline is broken and varied, with entrances placed in such positions, as to avoid betraying the dual character of the residence. It will be observed, that but one portal is seen from either front; or even in perspective. The apartments of each house are the same in number, dimensions and accommodations. The cost will, thus, be assessed equally, upon each of these messages. There is a



DOUBLE VILLA.



porch to each entrance, and a bay-window to each parlor, with balconies around the pile, which is two stories high, having a French roof, equivalent to a third story.

The corresponding parts, of both tenements, have the same letters affixed to them, upon the plans.

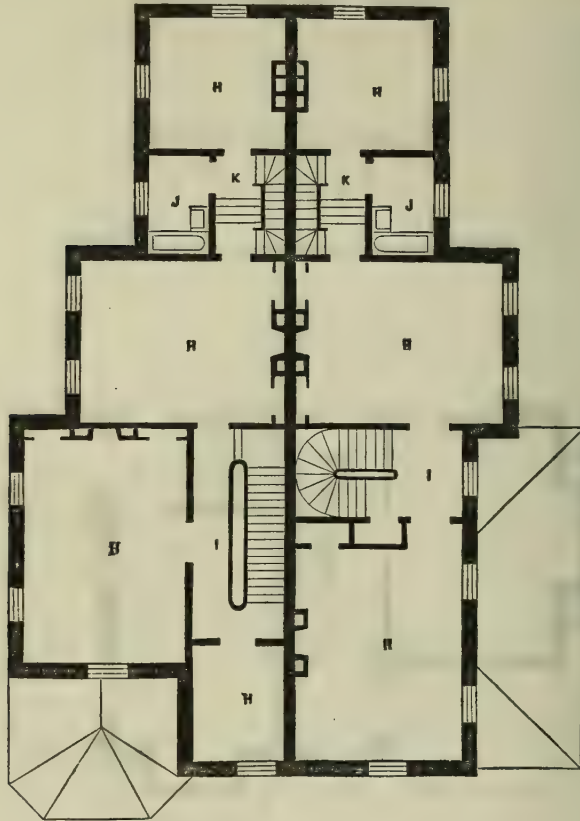
A, the Vestibule, 7 by 7 feet. B, the Parlor, 14 by 20 feet. C, the Stair-Hall, 7 feet wide, containing the Main Stairs, which are continued to the upper story. D is the Dining-Room, 14 by 18 feet. E, the Private Stairs leading to the second story. F, Butler's Pantry, which is entered from the passage and lighted by a window in the outer wall. G is the Kitchen, 12 by 12 feet. The second story has four Chambers, H H, H H, and Stair-Hall I, and a Bath-Room J, which is over the butler's pantry,

and of the same dimensions. K, the Landing of Private Stairs, with four steps leading up to the main floor.

The third story in the right-hand dwelling will have one additional room in the quadrangle occupied by the parlor and the second-story front chamber. By this means the same number of rooms is had, in both residences; there being no third story to the kitchen part.

A house as represented in either half of this description will afford ample accommodations for a family of six persons; and cost, in conjunction with its Siamese Twin, will be \$8,048.60, if built in accordance with the following condensed description:—

The cellar will extend throughout the whole building; seven feet deep in the clear. The walls will all be of stone, those in the cellar of the main part of



the house will be twenty inches thick, up to the floor; and they will be eighteen inches thick in the back building, and throughout the party-wall, up to the same level. The first story of the main building will also be eighteen inches thick; and all the others, throughout the whole building, will be sixteen inches thick, as will be, likewise, the foundations for the porches and steps. The exterior face will all be laid broken-range work; pointed off to an even surface. The cornices, window-sills, and heads and door-sills, will all be dressed in the ordinary way; and all properly set. All to be pointed with mortar, so as to produce a suitable contrast with the color of the stone.

All flues will be constructed with brick, topped out, above the roof, with stone. The flues to be well pargetted with mor-

tar. Furring-strips will be built in the exterior walls every three feet, one inch thick, and four inches wide, to hold the furring-laths.

The joists will be 3 by 10 inches square section, 16 inches between centres; all straightened and blocked on the walls, with one course of lattice-bridging through the centre of each tier, and properly framed, for trimmers to flues, stairs, &c. The roof will be constructed with double timbers, each set, 3 by 5 inches, substantially secured, and boarded over closely, for slate on the sides, and tin on the flat.

The floors will all be of good quality, one-inch heart-pine boards, mill-worked, and seasoned; none over 5 inches wide, and smoothed off after being laid.

The window-frames will all be made for sashes $1\frac{1}{2}$ inches thick and double

hung, with sham-axle pullies, and best cord.

The principal doors, on the first story, will all be $1\frac{3}{4}$ inches thick, six-paneled, and moulded on each face; those in the second and third stories will be $1\frac{1}{2}$ inches thick, six panels, moulded; and all closet doors will be $1\frac{1}{4}$ inches thick, and made to correspond with the room doors; all doors to be properly hung with butts, and secured with bolts and suitable locks. The front and vestibule doors will be walnut, and of double width, and require flush bolts, and transom sashes over them. The entrance doors to the parlor will be folding, with flush bolts, and all have mortice rebate-locks. The vestibule door will have glass panels above the lock-rail.

The dressings of the principal rooms, first story, will be seven inches, moulded architrave. The second story will be six inches wide, and all the rest four-inch moulding. There will be suitable washboards throughout; with sub and moulding in principal part of first story in main building.

The shutters of main building, first and second stories, will be inside; made in three folds, fitting to a jamb. Those of the first story will fold into soffits formed in the jamb to receive them; and the others will fold against the jamb. The principal windows will have elbow jambs and panel backs, the others will be finished in the ordinary way.

The principal stairs will be constructed in the usual way, the steps will be $1\frac{1}{4}$ inches thick, tongued, glued and blocked to the risers, and let into the wall-string. The rail $3\frac{3}{4}$ inches wide, moulded. The balusters $2\frac{1}{2}$ inches diameter, turned, and newel 8 inches diameter, also turned. A paneled and moulded spandrel, with door and closets beneath. These stairs will be continued to third floor.

The private stairs, in the rear, will extend to the second floor, with cellar stairs beneath them.

The plastering, throughout, is to be

done properly; with clean sand and fresh lime. A stucco cornice will be run in the angle of the ceiling of parlor, to girt 18 inches, one in hall, vestibule and dining-room, each to girt 14 inches. There will be a neat centre in parlor and dining-room, and a rosette both in vestibule and hall, for gas light. A cornice will be run around the principal room, second story, to girt 12 inches.

All the pine wood-work will require three coats of best white lead and linseed oil. The hard wood will be oiled three coats, and rubbed to a smooth surface. The kitchen, dining-room and pantry will be grained as oak; and varnished two coats.

All glass to be best American, except in the vestibule doors, the transom lights, and the head of front door, all of which will be best French plate.

All hardware to be of a good quality. The furniture to the front door, with bell-pull, will be bronzed; and the remainder of the principal parts of the first and second story will be porcelain; while the kitchen and upper story will be mineral. Four bells will be required, with copper wire, within tin tubes, concealed beneath the plastering. The roof will be covered, on the sloping sides, with slate of medium size, varied in color and form. The flat will be covered with tin, of best quality. All gutters will be constructed with tin, and the roofs of the porches and balconies will be covered with the same. The leaders will be put up properly, with the lower section and shoe of iron.

The gas-pipe will be of the requisite sizes, concealed beneath the plastering; and left ready for fixtures and metre.

A mantel will be set in the parlor, and another in the dining-room, as well as one to each of the second-story rooms above.

The range in the kitchen will be of medium size, with water-back and circulating boiler. The kitchen will have a cast-iron sink, of medium size, with supply of hot and cold water.

The bath-room will be fitted up with bath-tub, lined with copper, tinned, and have a supply of hot and cold water, with tubular shower over it. A wash-basin will be fitted up in the bath-room, with marble top counter-sunk, and closet beneath. A furnace will be set in the cellar, so arranged, as to warm all the rooms, except the one over the kitchen. The registers to be of a good kind, and of proper sizes.

The above is a brief description of the materials proposed to be employed, and the manner in which the work is to be executed, for a building of the class, we have here presented, which is taken as a basis for a Bill of Quantities, hereto appended, comprehending both homes:

231 yards excavations, at 40 cents per yard.....	\$92 40
68 perches of stone in cellar walls at \$2 per perch.....	136 00
Laying the same, including mortar, at \$3.50 per perch	238 00
78 perches in partition wall, at \$2 per perch.....	156 00
Laying the same, including the mortar, at \$4 per perch.....	312 00
150 perches of face-work, at \$3.50 per perch for the stone	525 00
Laying the same, including the mortar and dressings, at \$6 per perch.....	900 00
14,000 feet of joists at \$22 per M.....	308 00
4,000 feet of scantling, for the roof, at \$22 per M.....	88 00
4,600 feet of scantling, for partitions, &c., at \$22 per M...	101 20
4 500 feet sheathing-boards, at \$28 per M.....	126 00
4,800 feet flooring, at \$45 per M.....	216 00
Window frames, including sash	420 00
Inside shutters.....	300 00
Outside shutters to back building.....	40 00
Mill-work dressings.....	375 00
Washboard and moulding to same.....	130 00

Framing and laying the joists	\$80 00
Preparing the roof for slate and tin, including the cornices.....	165 00
Constructing the porches and balconies.....	210 00
Doors, all complete.....	300 00
Putting up stairs, including materials.....	350 00
Preparing the building for plastering.....	245 00
Finishing, after plastering...	320 00
1,400 yards of plastering, at 50 cents per yard.....	700 00
Stucco cornices and centre-pieces.....	65 00
Painting and glazing.....	590 00
2,500 feet of tin on roof and gutters, at 14 cents per square foot.	350 00
1,500 feet of slate roof, at 14 cents per foot.....	210 00
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	\$8,048 60

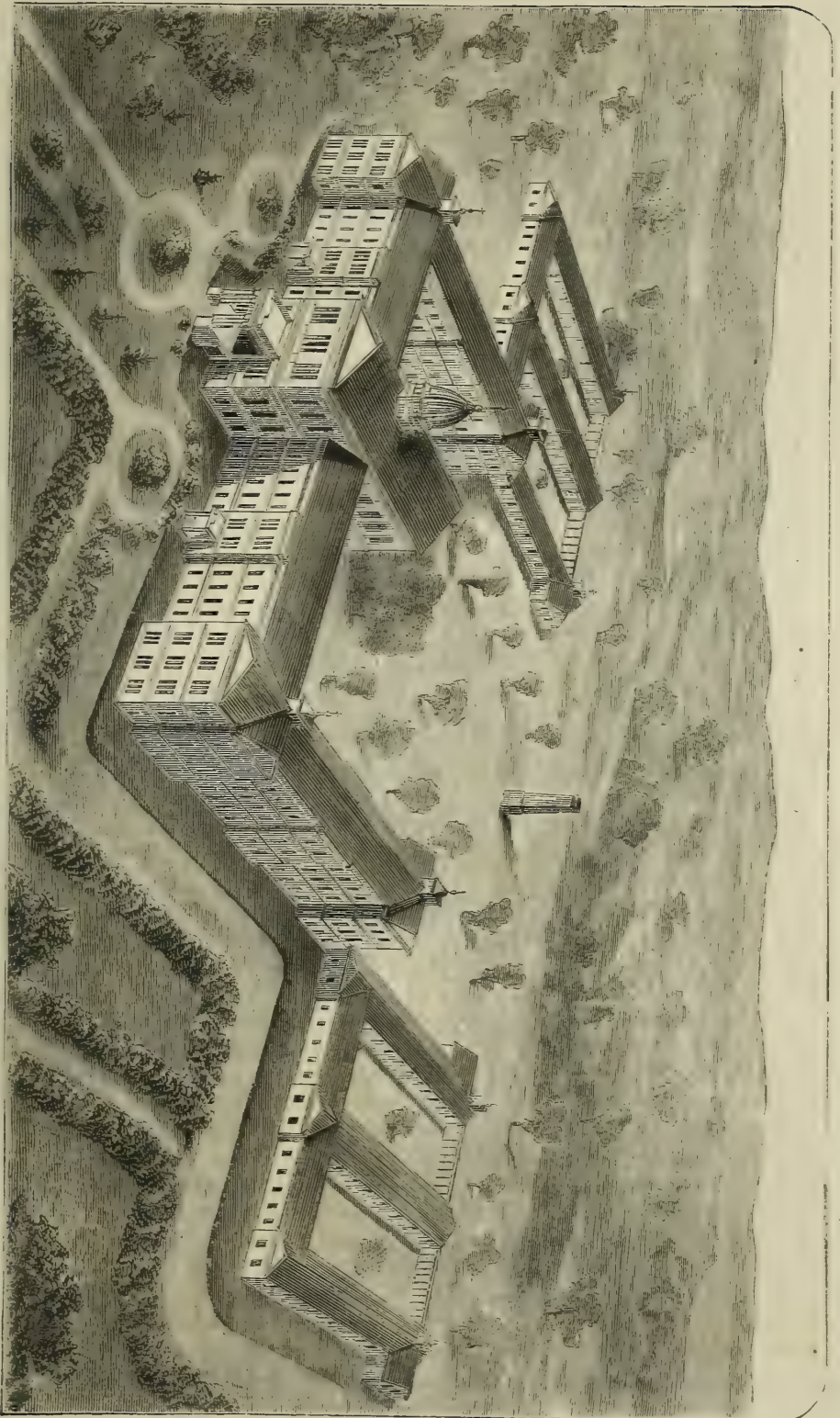
THE PENNSYLVANIA HOSPITAL FOR THE INSANE,

AT PHILADELPHIA.

DEPARTMENT FOR MALES.

THE PENNSYLVANIA HOSPITAL FOR THE INSANE is situated in the twenty-fourth ward of the city of Philadelphia, on a fine tract of one hundred and thirteen acres of beautifully undulating land—with fine groves of forest trees—which has been greatly improved by judicious planting, by laying out and making several miles of carriage-drives and dry foot-walks, and by the construction of green-houses and summer-houses, to add to their attractiveness. It consists of two departments, that now reserved for females, which building was first opened in 1841, for both sexes, and that for males, which was first used in the year 1859. Each of these is a complete hospital, and each has all the arrangements that science and experience

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have shown to be desirable in such institutions. The separation of the sexes, and the use of two distinct buildings, give a degree of minuteness of classification, not elsewhere known; the arrangements permitting no less than sixteen classes for each sex.

The history of this institution is one of great interest. It dates back to 1751, in which year a number of the benevolent citizens of Philadelphia united in founding the Pennsylvania Hospital, which was soon after incorporated by the Provincial Assembly, its charter being general in character, and providing for the reception and care of the insane, and of those afflicted with other diseases, not contagious. This was the first provision for the insane in America. Except some assistance towards the erection of the original buildings, on the square between Spruce and Pine, and Eighth and Ninth streets, it has, ever since its foundation, been entirely dependent, for its support, on the liberality and philanthropy of private citizens. It receives nothing from the public treasury of city, county, or State; and all its improvements, and all its means for carrying out and extending its benevolent designs have come from individuals who were interested in the great objects for which it was established.

The first patient was received into its wards in 1752, and up to the first day of 1841, the insane continued to be treated in the original structure, at Eighth and Pine streets. At the date last named, a new building, called "*THE PENNSYLVANIA HOSPITAL FOR THE INSANE*," was opened, two miles west of the river Schuylkill, between Market and Haverford streets; and to this structure, the insane were removed, with as little delay as practicable. These grounds were purchased, and this building erected and furnished, from the proceeds of certain vacant lots, surrounding the old hospital, which, although they had cost only about \$10,000, ultimately yielded more than

\$325,000; and with which sum the work was accomplished.

In process of time, the Pennsylvania Hospital for the Insane became crowded with patients; and Dr. Thomas S. Kirkbride—who had been its Chief Physician and Superintendent from its opening—in his report for 1853, urged the erection of an entirely new hospital on the grounds belonging to the institution, and a complete separation of the sexes; and recommended that this should be effected by an appeal to the liberality and benevolence of the community. After mature deliberation, these suggestions were approved by the Board of Managers; and ultimately, the whole scheme was carried out, in a most thorough manner. The long experience of the institution, and its Superintendent, permitted every detail to be arranged before the commencement of the work; and under the supervision of Samuel Sloan, architect, the whole was finished, in a manner, which ten years' experience in actual use, has demonstrated, for all the purposes of such an hospital, to be equal, if not superior, in all points, to the edifices and accessories of any cognate institution, erected either before or since. This is high commendation, but fully justified by the testimony of the many professional men who have inspected it, and especially by the resolutions adopted by the American Association of Hospital Superintendents, after their visit, in 1867.

It is this new hospital,—the Department for Males,—that we specially propose illustrating in the present number of the Review, as exhibiting the present advanced state of hospital architecture, and as a structure which, after being thoroughly tested by nearly ten years' use, it is believed can hardly be improved either in regard to the completeness of its arrangements, or its facilities of every kind for carrying out the great work, to which it is dedicated,—the comfort and restoration of the insane.

Before we enter into the details under

the different heads, it will be proper to note the points of the attached ground plan, or, rather, underground plan, following the letters, in regular order, through as condensed a description as will suffice to give our readers a clear comprehension of all its parts.

This plan shows the entire Cellar, with the arrangement of the Steam Coils in the various Air-Chambers, all of which are beneath the Corridor, with the Cold Air Duct in the centre, which is a continuous line from the Fan, at the Engine-house, to the eastern end of the farther Wing, a distance of more than one thousand eight hundred feet.

The plan also represents the cross-walls or divisions of the ground plan proper, or first floor.

A is the Corridor; opening from which is the Main entrance, with the Air-Chambers represented in the shading, in the cellar, beneath it. B is the Kitchen, on the ground floor. C and D are Store-rooms, on the same floor. E is the Trunk-room. F, Clothes-room. G, Dining-room of the domestics. H, the Officers' Dining-room. I, House-keeper's Room. J, Store-room. K, the Scullery. L, the Cold Air-Duct. M M, Railway, that extends from the Laundry to the extreme end of the building. N N are the Gymnasiums, and O O, the Outmost Wards for the most noisy patients, with P P, the Yards, attached to the latter. R is the Fan. S, the rear end of the Boilers, where these last connect with the underground Flue, that leads to the Chimney. T designates the Engineer's Work-room; in the rear of which is the Engine-room, containing the Steam-Engine, the Pumps, the Gas Metre, etc. V is the Coal Vault.

Figure 1 is the Main Chimney, entirely detached from every portion of the edifice, above ground. 2 is the Boiler Flue, with the Culvert beneath it. 3 is the Culvert from the eastern end of the building. Over this Culvert, lies the Ventilating Pipe, leading from that portion of the pile to the Chimney. 4 and

5 likewise are Drains, with the Ventilating Pipe above them. 6 6 are the Cess Pools or Inlets for surface drainage.

This HOSPITAL faces the west; and consists of a centre building, with wings running north and south, making a front of 512 feet, of other wings, connected with each of those just referred to, running east a distance of 167 feet, all three stories high, and these last having, at their extreme ends, communications with extensive one-storied buildings. All the exterior walls are of stone, stuccoed, and the interior are of brick.

This arrangement gives provision for the accommodation of sixteen distinct classes of patients in the entire edifice. Each one of these sixteen wards has connected with it, besides the corridors, for promenading, and the chambers of the patients and attendants, a parlor, a dining-room, a bath-room, a lavatory, a water-closet, a urinal, a sink-room, a wash-room, a drying-closet, a store-room for brushes and buckets, a clothes-room, a dumb-waiter, a dust-flue, and a stairway passing out of doors, if desired, without communication with the other wards. Every room in the building, almost without exception, has a flue communicating with the fresh-air duct, for warm or cool air, according to the season, and with the main ventilating trunks, in the loft, which terminate in the various ventilators on the roof of the building.

The centre building is 115 by 73 feet. It has a Doric portico of granite, in front, and is surmounted by a dome, in which are placed the iron tanks whence the whole building is supplied with water. The lantern on the dome is 119 feet from the pavement.

In the basement, or first story of the centre building, are the main kitchen, 42 by 24 feet, in which are improved arrangements for cooking; a scullery, 24 by 11; two store-rooms, each about 20 by 22 feet; a trunk-room, 24 by 12 feet; a general clothes-room, a bread-room, a dining-room for the officers, another for

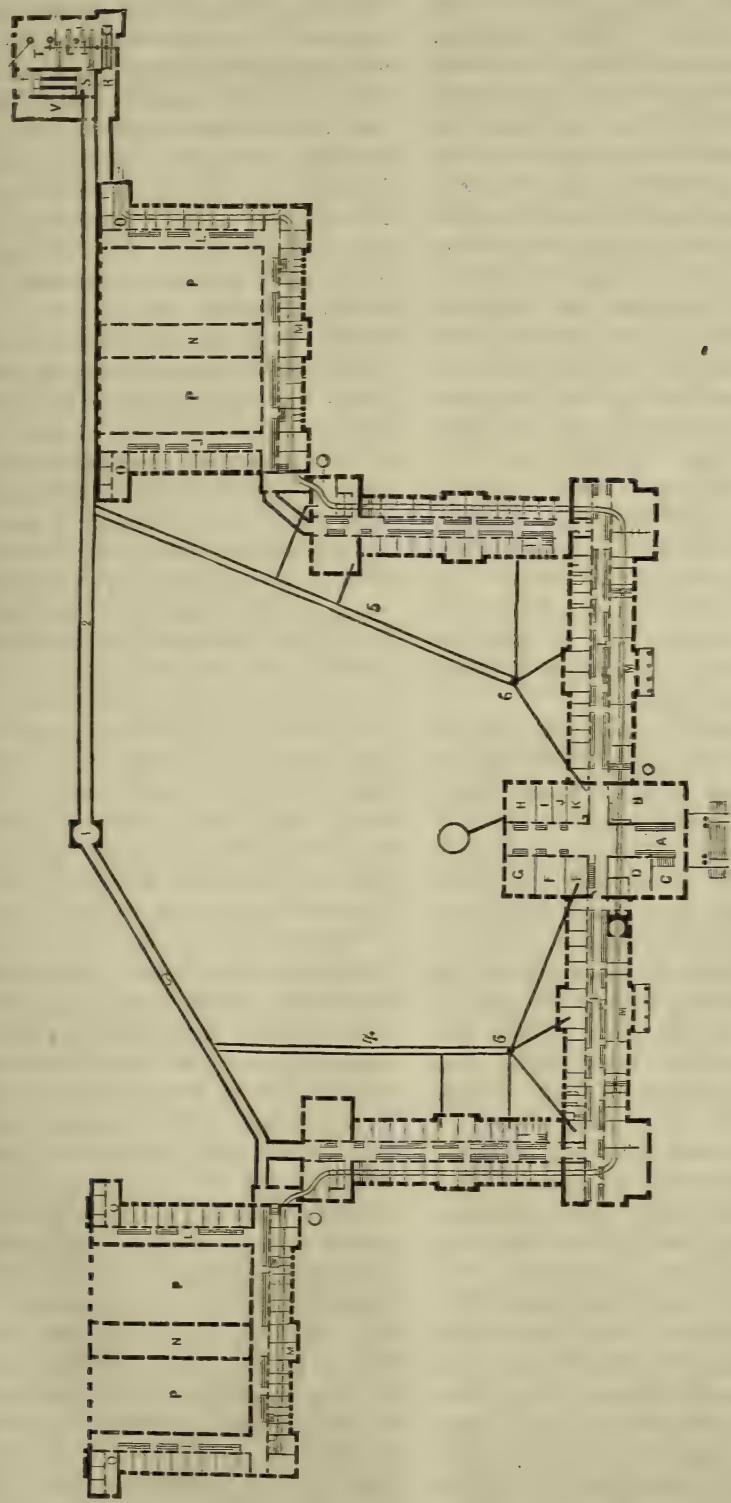


FIG. 1.—PLAN FOR THE SYSTEM OF HEATING AND VENTILATION
OF THE
MALE DEPARTMENT, PENNSYLVANIA HOSPITAL FOR THE INSANE, PHILADELPHIA, PA.

the domestics, a lodging-room for the seamstress, another for the supervisor of the basement, a stairway to the main story, with a dumb-waiter leading from the kitchen to the cellar, and another to the upper rooms of the centre building. The cellars under the centre building, besides containing the hot-air chambers for that division of the house, have three distinct rooms for storage. In front of the basement, and under the steps and adjoining roadway, are the coal vaults for the kitchen and bake-room, and the ice-house; and carts unload into both, through openings in the blue stone flagging, laid upon the vaulting, which forms the roadway. There is also a small kitchen, near the scullery, intended for the superintendent's family, whenever it is required for the purpose. In one of the store-rooms is a dark apartment, and in another the tanks for the oxygen and hydrogen gases used for the dissolving-view apparatus.

On the second or principal story is the lecture-room, 42 by 24 feet, in the lecturer's table of which, water, steam, and gas, for experimental purposes, have been introduced. It also contains commodious cases for apparatus, a black-board running on a track behind the cases, and a smooth surface, 24 by 18 feet, at its eastern end, on which the dissolving views are shown. On the opposite side of the main corridor is a reception room for visitors, and a room for visits to patients by their friends, each being 24 by 23 feet. There are also, on this floor, two small rooms for more private visits, the medical office and the library, which is also the assistant physician's office, 24 by 14 feet, with a small store-room, containing a sink, etc., adjoining; the lodging-room for the assistant physician having charge of the medical office, with which it communicates; a general business office, which is also that of the steward, 24 by 20 feet; a manager's room, 24 by 19 feet, which is also the principal physician's private office; a parlor, 24 by 19 feet, for the

use of the officers of the house; and a fire-proof, 11 by 9 feet, in connection with the general business office. In the third story front are four fine rooms, each 24 by 21 feet, a corridor, 42 by 16 feet, shut off from the adjoining portion by a partition having sashes filled with ground glass; a bath-room, water-closet, and clothes-closets, intended for the use of the family of the superintending physician. There are likewise on this floor, chambers for the steward and matron, for the senior assistant physician, three others that may be used as deemed expedient, and a room 24 by 11 feet, lighted from the roof, and intended for a general store-room for the bedding and other dry goods not actually in use.

The corridors of the centre building, running east and west, are sixteen feet wide; those running north and south, in which are the stairways, lighted from the roof, are twelve feet wide.

The height of the ceiling of the basement in the centre building, and of all parts of the wings and one-storied buildings, except the upper story of the wings, which is one foot more, is twelve feet. The ceilings in the second or principal, and in the third story of the centre, are eighteen feet high.

The wings on each side of the centre building are almost exactly alike, in arrangement, except, that on the south side, in front, in the basement immediately adjoining the centre, is the ironing-room, 28 by 11 feet, with a drying-closet, 11 by 11 feet, attached, and, in the rear, the small kitchen, already referred to, and the lodging-rooms of the female domestics; while, on the north side, in corresponding positions, are the bake-room, the baker's store and lodging-rooms, and the lodging-rooms of the hired men not employed in the wards. On this floor, on each side of the centre, is also a museum and reading-room, 42 by 14 feet, and accessible, either from the grounds, or from the inside of the building, two work-rooms for the patients, two lodging-rooms for persons

employed in the work-rooms, a bath-room for the officers and another for the domestics, two water-closets, etc. The portion of the wing just described is shut off from the adjoining part (which constitutes the fifth ward) by a partition with thick ground glass; this ward having in it a large room, 29 by 24 feet, with a bath-tub and water-closet in a recess, another 24 by 14 feet, a third 23 by 11 feet, and five rooms 11 by 9 feet, a bath-room, drying-closet, and all the other conveniences already mentioned, as forming a part of each ward. These apartments and arrangements are intended for patients who are particularly ill, and require special quiet and seclusion, where they may be visited, if deemed expedient, by their friends, without annoyance to others, or interfering with the discipline of the house.

Besides the fifth ward, just described, and which is on the first floor, there are on each side of the centre, two other stories, each of which constitutes a ward, and with all the conveniences already referred to. The rooms are arranged on both sides of the corridors, which are twelve feet wide, and have their extreme ends mostly filled with glass; while, wherever one wing joins another, there is entirely across it an open space for light and air, eight feet wide, glazed with small sash from near the floor to the ceiling; and in the middle of each ward, on one side, is a similar open space, all of which may be used for keeping flowering plants, birds, etc., for having small jets of water, or any other objects of interest, and which in excited wards, may be guarded by ornamental wire-work. Each story of the return wing makes a ward similar to those just described.

Passing from the return wings into the supervisor's office, the one-storied buildings are reached. Each of these has provision for twenty-six patients and six attendants, and every arrangement for their comfort. The rooms are here on one side of a corridor ten feet wide, and at the end of each of those

running towards the east is a cross hall, in which are three rooms, intended particularly for patients, who, from any cause, may require special seclusion. One of the main halls is used for dining, and the other as a sitting-room. Between the dining-halls of these two wards, (the seventh and eighth,) and made private by sliding doors, are four rooms intended for excited patients, who have special attendants. Opposite these last is a room 110 by 14 feet, with an arched ceiling, 15 feet high, with skylights and windows out of reach, intended to be used as a kind of gymnasium, and accessible either from the adjacent garden and yards, or directly from the wards; and in the story below this is a room of the same size, in which are two fine bowling-alleys, with reading-tables, etc. Both these rooms may be well-lighted with gas, and warmed by steam-pipe, so that they can be comfortably used in the evening, as well as by day, and in all kinds of weather.

The arrangement of these one-storied buildings makes for each, two very pleasant yards, in size 110 by 54 feet, surrounded by broad brick pavements, and having grass in the centre, with an open iron palisade in front, giving an extended view of the grounds. There is also a yard, 343 by 72 feet, adjoining each sixth ward, fitted up as the others, and planted with shade-trees. Brick pavements surround the entire building, making, with those just referred to, and those in front, a continuous walk of 6,152 feet.

ENTRANCE.—The entrance to "the Department for Males," is from Fortyninth street, between Market and Haverford streets. The gatekeeper's lodge has two comfortable rooms on the north, while on the opposite side of the gateway is a dead-room, and another for tools used about the grounds. Brick paths, on either side of the main roadway, lead to the centre building, and the space in front planted with evergreen and ornamental trees, and having a fountain in

the central grass-plot. The latter is 325 by 175 feet. From the front platform, eight steps lead up to the vestibule, and seven steps, inside of the building, to the level of the principal floor.

Ten steps descend from the roadway to the pavement around the basement, which, except immediately at the front of the centre, where it is surrounded by a wide area, with sodded banks, is everywhere above ground.

ENGINE-HOUSE AND LAUNDRY.—The engine-house, 71 feet from the nearest point of the hospital building, is a substantial stone structure, 70 by 64 feet, and two stories in height. The character of the ground is such, that carts drive into the second story, to discharge the coal, directly into the vaults below; and the level of the railroad in the cellar of the hospital brings it upon the second floor of the engine-house.

The first story, at the level of the ground on its southern and eastern side, contains vaults capable of storing near five hundred tons of coal. Adjoining these vaults is the boiler-room, 30 by 17 feet, and opening into the engineer's work-room, in which are lathes, grind-stones, pipe-cutting machines, etc., driven by the engines, which are in the engine-room, 23 by 19 feet in size, and separated from the last by a glass partition; while, further west, also separated by glazed windows and doors, is the fan-room and the tower for supplying fresh air to the main duct, which leads from it, through the entire building. The height of the ceiling in this story is 17 feet, and it is arched, over the engine-room and the engineer's work-room, so as to give a proper support to the stone floor of the room above. In the second story of this building, into which the railroad passes, is the wash-room, 27 by 24 feet; the room for assorting and folding clothes, 24 by 14 feet; the mangle-room, 43 by $8\frac{1}{2}$ feet; the drying-closet, occupying a space 26 by 13 feet; a water-closet; and a large room over the coal-vaults and boilers, surrounded by movable

blinds, and intended for drying clothes, without the use of artificial heat, for making soap, etc.

THE CARPENTER SHOP, 36 by 50 feet, is two stories high, and 45 feet from the engine-house, whence steam may be taken for warming it in winter, and for driving machinery.

SIZE OF ROOMS.—The height of the ceilings, throughout the building, and the size of the parlors and of all the rooms in the centre building, have been already given. The ordinary size of the patients' lodging-rooms is 9 by 11 feet, while there are some, in each ward, of a much larger size, many of which have communicating doors, and are intended for patients, who desire a parlor, as well as a chamber, or for those having special attendants. The parlors in the first and third wards are 33 by 24 feet, and in the second, fourth, and sixth they are 23 by 30 feet. The dining-rooms are generally 23 by 17 feet. The bath-rooms are mostly 9 by 11 feet. Sixteen rooms in each one-storied building have water-closets in them, firmly secured, and with a strong downward draught. The sides of doors and windows in patients' rooms are generally rounded, by being built of brick, made expressly for the purpose, and smoothly plastered.

WINDOWS AND WINDOW GUARDS.—The windows in patients' rooms are almost universally 6 feet by 2 feet 9 inches, having twenty lights of glass, 6 by 17 inches, in each. In the front wings adjoining the centre, and in the third story of the return wings, both upper and lower sashes are of cast-iron, secured in wooden frames, so arranged as to balance each other, rising and falling only to the extent of five and a half inches, and doing away with the necessity for guards. In the other parts of the return wings, and in the one-storied buildings, the windows are of the same size, have the upper sashes of cast-iron, and immovable, the lower being of wood, rising to its full extent, and protected by an ornamental wrought-iron guard,

securely fastened on the outside. A few rooms, in each one-story building, have small windows, out of reach of their occupants, intended for the temporary seclusion of very violent or mischievous patients. In other parts, as well as in this, wire screens inside of the rooms are occasionally used to protect glass, and ornamental wire-work is adopted in some of the parlors, at the ends of corridors, and in other similar positions, as a guard outside of the windows.

DOORS.—The doors throughout are made of the best white pine lumber. In the wards they are $1\frac{3}{4}$ inches thick, 6 feet 8 inches high by 2 feet 7 inches wide. Each door has eight panels in it, one of which makes a hinged wicket, and what is commonly known as bead and butt, very substantially put together; and, wherever special strength is required, it is obtained by transverse pieces of iron, let into the wood, or by plates of boiler-iron, screwed on and painted, so as to resemble an ordinary door. Each door has a good dead-lock to it, and occasionally a mortice-bolt is added. Over each door is an unglazed sash, 31 by 17 inches, covered with fine wire on the inside, or a space 31 by 5 inches, which can be filled up at pleasure, by a tight board, or by wire. Lift hinges have been used for all these doors, which, for patient's lodging-rooms, always open into the corridors.

FLOORS.—The floors throughout are of the best yellow pine, cut to order in Florida; and piled up on the grounds two years, before it was used. The boards are one inch and a quarter thick, varying in width from two and a quarter to four inches, and put down with secret nailing. Counter-ceiling is everywhere used. The only exception to this kind of flooring is in the two kitchens, the scullery, a space in the basement hall in front, the bake-room, all the sink, water-closet, and wash-rooms, the line between different wards, the entrance to the stairways, and the main wash-room in

the engine-house, which are of brown German flagstones, laid on brick arches; the engineer's work-room, which is paved with brick; the front of the boiler-room, which is of iron and blue stone flagging; and the engine-room, one sink-room, and all the ward stairways, which are of slate, admirably adapted to such a purpose—from the quarries of Eleazer Jones & Co., at East Granville, N. Y.—which has also been used extensively, for window-sills, stairways, and other purposes.

STAIRWAYS.—All the stairways, in those parts of the building occupied by patients, are fire-proof. The framework is of cast-iron—built into the brickwork on each side, and covered with slate—which has many advantages. The rise of these steps is only seven inches; and there are platforms every five or six steps, with convenient hand-rails on both sides, from top to bottom. They are all well lighted from windows by day and from gas at night. The well, around which the stairs wind, is used for hat or coat-rooms, for the different stories.

PLASTERING.—The inside plastering is what is called hard finish, composed of lime and sand, without plaster of Paris, except for ceilings, and well troweled. This finish admits of being scrubbed for years without injury, and is at all times ready for painting. The outside of the building is roughcast, the material used being the pulverized stone, of which the house is built, and lime, to which an agreeable shade of color is given by sand obtained in Montgomery county, Pa. Hydraulic cement is used near the ground, in certain positions, in many of the sink and wash-rooms, in the kitchen and scullery, in the main wash-room, and, as a substitute for the ordinary wash-boards, in many of the ward corridors and patients' chambers.

ROOFING.—The roof is of Pennsylvania slate, fastened on lath, and plastered with hair mortar on the under side. The pitch is one-fourth of the span. The water from the roof is carried off, through

four inch cast-iron pipes inside of the building, easily accessible, and falls into large drains leading into the main culvert.

SEWERAGE—The main culvert is 2,032 feet in length. It is 35 inches from top to bottom in the clear, built of brick laid in hydraulic cement, egg-shaped, the smaller part being at the bottom. Through this culvert—intersected by branch culverts at various points in its course—all the drainage from the building, and much of that from the grounds, is carried off.

BATH-ROOMS, &c.—There are twenty-one bath-rooms and as many water-closets in the building in addition to those in the patients' rooms. Sixteen are in the wards. Each bath-room has in it a cast-iron bath-tub, covered with zinc paint, possessing improved arrangements for the admission and discharge of water through the bottom. In addition to the ordinary hot-air flue, there is a coil of steam-pipe, for direct radiation, in each, so that when hot baths are used the temperature of the room may be made so high, as to prevent the sensation of chilliness, when coming from the water. The water-pipes in these rooms are generally of galvanized iron, left exposed, so as to be readily accessible, and passing from story to story, through castings, made for the purpose, so that in case of leakage the ceilings may not be injured.

The water-closets are of cast-iron enameled, have no traps, but are open, so as to have a constant downward draught of air through them into the main chimney, as have all the sinks, bath-tubs, &c., in the whole establishment. The water is let on by the opening of the door.

The wash-basins in the wash-rooms are of marble, with strong swing-cocks.

The sinks are of cast-iron, and have hot and cold water at each. There is also an iron hopper to each, into which the slops, &c., are emptied. There are

permanent fixtures for securing the towels in each wash-room. The drying-closets are sufficiently large to contain a bed; and, like the closets for buckets, &c., have flues leading into and from them, thus securing a direct communication with the fan below and the ventilating ducts above. All these arrangements in each ward are clustered together, and have scarcely any wood, in any part, to absorb moisture, or retain unpleasant odors.

SUPPLY OF WATER.—The hospital is supplied with water from a well 25 feet in diameter, containing 50,000 gallons. By means of one of Worthington's combined direct acting steam-pumps, capable of raising 10,000 gallons per hour, this water is forced, through 708 feet of six-inch cast-iron pipe, into the four boiler-iron tanks in the dome, whence it is distributed through the entire building. These tanks are 103 feet above the well, and contain 21,000 gallons. They are so arranged, that one or all may be used at pleasure, having overflows, and pipes through which the sediment may be washed out, whenever deemed desirable. The elevation of these tanks is sufficient to secure the feeding of the steam-boilers, when carrying a pressure of forty pounds to the inch. These tanks were made at the works, and put in place before the roof was on the building. It is intended that they shall always be nearly full of water, and a small pipe, leading from them to the engine-house, tells the engineer on duty when that is the case. There is also, in the engine-room, a single Worthington steam-pump, capable of raising 5,000 gallons per hour, intended to prevent any possible deficiency of water, should an accident happen to the larger engine. The rule is that both should be used some part of every day, so that, in case of emergency, there may never be a doubt of their being in working order.

The tank for supplying the centre building with hot water is 12 feet in length

and 23 inches in diameter, is placed above the cooking-range—the heat being supplied through circulating pipe from a water-back, behind one of the range fires—and is abundant for all purposes. The supply of hot water for the wards is derived from six iron tanks, placed in the most convenient points in the cellar, in which situations they are easily accessible, while leakages can do little injury to the building. The heat is derived from steam coils coming from the summer pipe—as it is called—used for cooking and all other purposes, except warming the building. The large steam-boilers, at the engine-house, are supplied with hot water by the condensed steam used in heating, which ordinarily returns to them by gravity; but when it does not, is received into an iron tank, and forced into them by a small steam-pump. The laundry has hot water from a large tank—placed in the oven which covers the boilers, through which the exhaust steam, from the engines and pumps, can be made to pass whenever desired—which may be also used for feeding the large boilers.

LIGHTING.—The hospital is lighted by gas from the City Works. The fine metre, from Code, Hopper & Gratz, is set up in the engine-room; and a record is made every morning of the consumption during the preceding night. Stop-cocks are placed at convenient points for checking the flow of gas through the main pipes; and the ordinary kinds of fixtures have been adopted throughout the building. The gas is also used for experimental purposes in the lecture-room, and for boiling water, &c., in the medical office.

HEATING AND VENTILATION.—There is no fire used in any part of the hospital for heating, although provision for open fires has been made in all the parlors and in many of the other large rooms, should such an arrangement ever be deemed desirable. The only fires kept up in the building are those in the kitchens, bake and ironing-rooms.

In the boiler-room at the engine-house there are three large tubular boilers. Each of these has a furnace 5 feet 3 inches wide by 5 feet 3 inches long, and 7 feet 4 inches high. The shell is 17 feet 8 inches long, by 4 feet six inches in diameter. Combustion chamber 4 feet long, and 98 tubes, $2\frac{1}{2}$ inches in diameter and 11 feet long. The total heating surface for each is 744 square feet. The grate surface is $20\frac{1}{4}$ square feet. The escaping gases enter a common flue; and the draught can be regulated, by a damper at the back end of each boiler; or the supply of air graduated, by a register in the ash-pit door.

These boilers furnish steam for warming the entire hospital, driving all the machinery, pumping water, ventilation, washing, cooking, &c. They are so arranged, that one or all may be used at pleasure, either for heating, or driving the machinery. The steam, carried from them, in a five-inch welded iron pipe, after reaching the hospital building, is distributed in eighty-three air-chambers, placed in its cellar, with direct flues leading from them to the apartments above. The gases from the boiler fires pass through an underground flue, 4 feet wide and 6 feet high, a distance of 557 feet, rising 31 feet in its course, till it comes to the foot of the main chimney, which is 78 feet above the surface of the ground. The chimney is built double, the interior being round, formed of hard brick, without pargeting, six feet in diameter in the clear from bottom to top, the latter being formed of cast-iron, while the foundation is of pointed stone-work, to a height of eleven feet, and the remainder of pressed brick. The underground flue, alluded to, contains the main steam-pipe, until it reaches the nearest point of the building, and also that portion of it which is carried to the north section of the hospital; and is immediately over the main culvert.

This chimney is made the ventilating power, for securing a strong downward draught of air, through all the water-

closets, urinals, sinks, and bath-tubs, in the entire establishment; and, for this reason, is placed in a central position, on the eastern side of the building. The coils for heating are composed of welded iron pipes, three-quarters or one inch in diameter, and are in two sections in all the air-chambers, so that one or both may be used, according to the severity of the weather.

In the engine-room are two horizontal high-pressure steam-engines, of fine finish, from the works of I. P. Morris & Co. They are exactly alike, each having a cylinder 10 inches in diameter, and a stroke of 24 inches. They are so arranged, that either may be substituted for the other, and one may be made to do the work of both, in case of emergency. Ordinarily one drives the fan, and is therefore a part of the ventilating apparatus, while the second drives all the other machinery. The fan, made by William Sellers & Co., is of cast-iron, its extreme diameter being 16 feet, and its greatest width 4 feet. It is driven directly from the shaft of the engine, and its revolutions vary from 30 to 60 per minute, according to the requirements of the house. The fresh air is received from a tower, 40 feet high, so that all surface exhalations are avoided, and is then driven through a duct, which at its commencement is $8\frac{1}{2}$ by $10\frac{1}{2}$ feet, into the extreme parts of the building. From the cold air-duct, openings lead into the different warm air-chambers, which, in the one-storied buildings, are covered with slate; but in all other parts of the hospital these chambers and air-ducts are arched with brick, laid with smooth joints. The warm air, in nearly all cases, is admitted near the floor; and the ventilators open near the ceiling, always in the interior walls. The only exception to this arrangement is in the one-storied buildings, in which, in the patients' rooms, the warm air is admitted above, and the ventilators are taken off near the floor. All the ventilating flues terminate in the attic in close ducts—

either of brick or wood, smoothly plastered, increasing in size, towards their outlets, about thirty per cent. more rapidly than the capacity of the flues entering them—by which, through the different belvederes on the roof, they communicate with the external atmosphere. In the centre building, the ventilation is through the main dome.

All the pipe used for heating and water, the bath fixtures and water-closets, were made at the works of Morris, Tasker & Company, and the entire apparatus was arranged and put up by the institution. There is no leaden pipe used in any portion of the building.

COOKING AND DISTRIBUTION OF FOOD.

—All the cooking is done in the central kitchen, which has a large range, with two fires and three ovens, a rotary roaster, a double iron steamer containing ninety gallons, a smaller one, iron outside and copper-tinned on the inside containing forty-five gallons, and six of tin for vegetables, besides the vessels for tea and coffee. The food, prepared in this room, is put into closed tin boxes, which are lowered by a dumb-waiter to the car standing on the track of the railroad, where it passes under the kitchen, and is thus conveyed to the bottom of the various dumb-waiters, which lead directly to the different dining-rooms above, of which, as before remarked, there is one for each ward. Each dining-room has a steam-table, with carving dishes on it, and abundant provision for keeping meats and vegetables warm as long as may be desired. The dumb-waiters are all controlled by the person having charge of the railroad; they are moved by a crank and wheel; and wire-rope is substituted for that commonly adopted.

The railroad is an indispensable part of the arrangements for distributing food. By its use a meal may be delivered in all the ward dining-rooms (eight in number) on one side—the extreme ones being 580 feet distant—in ten minutes after leaving the kitchen, or for

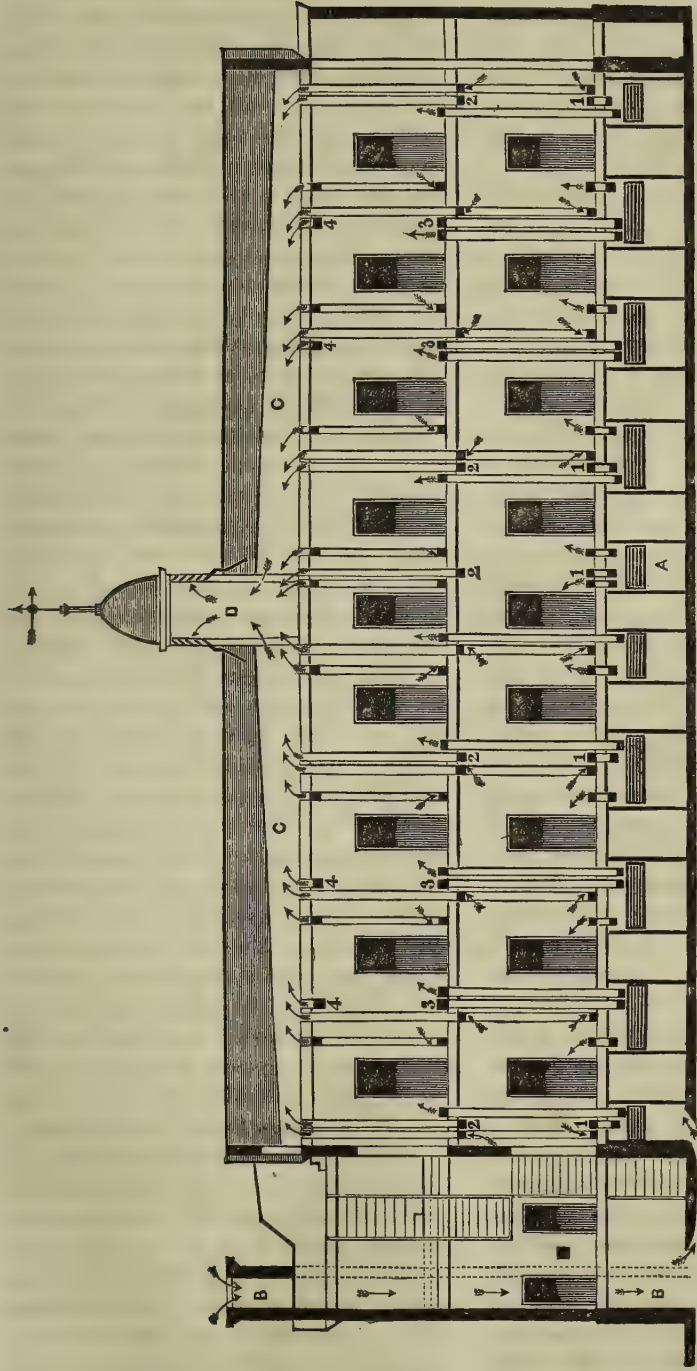


FIG. 2.—LONGITUDINAL SECTION.

A. One of hot-air chambers in cellar. B. Vertical shaft supplying cold air to fan. Hot-air flues are indicated by *arrows* pointing outwards; ventilating flues are the reverse. Warm-air flues that supply second story commence eight inches lower in air-chamber than those which warm the first story. The flues marked 1 are

warm-air flues for the corridor on first floor; 2, are ventilating flues for same. Those marked 3 show warm-air flues to corridor of second story. 4. The ventilating flues to same. C. C. Foul-air shafts in the loft, into which all the ventilating flues discharge. D is the outlet through a cupola in the centre.

the whole sixteen in twenty minutes. It also forms a very convenient mode of transporting articles from one section of the building to another, carrying clothing to and from the laundry, and gives a protected passage-way in going from the centre building to the engine-house, barn, and workshop.

PROVISION AGAINST FIRE.—As already mentioned, no fires are required, in the building, for warming it; and gas is used for lighting. Wherever one wing comes in contact with another, or with the centre building, all the openings in the walls, which extend up through the slate roof, have iron doors, in addition to the ordinary wooden ones, which may be closed at pleasure. The floors of the kitchen and bake-room, in which alone fire is used, are of flagstone laid on brick arches, and all the stairways in the wings are fire-proof. It is intended that there should always be about 20,000 gallons of water in the tanks immediately beneath the dome of the centre building; and 15,000 gallons per hour may be placed there by the pumping-engines. A standpipe, connected with this reservoir, passes into every story and into every ward, in all of which it is intended to have a piece of hempen hose constantly attached, so that, by simply turning a stopcock, water may be put on a fire, almost as soon as discovered. A steam-pipe also passes up into the attic of each wing; and, as one of the large boilers is constantly fired up, steam may, at any moment, be let into the building, by simply turning a valve in the cellar. Hose is also kept near the steam-pumps, so that it may be promptly attached, and water thrown on the barn, carpenter shop, engine-house, and contiguous parts of the hospital. A watchman is constantly passing through the house at night; and by means of two Harris watch-clocks, as made by H. B. Ames, of New York, there is no difficulty in ascertaining, not only how often each ward is visited, but almost the moment the visit was

made, and, of course, the time taken in passing from one ward to another.

LAUNDRY ARRANGEMENTS.—The clothing, bedding, &c., collected in the different wards, after being sent to the cellar, are conveyed from that point, by the railroad, to the room in the engine-house, for assorting clothes, and thence into the large wash-room, in which, besides the usual washing, rinsing, and blue tubs and soap vat, are one of the valuable Shaker washing-machines, in which six different kinds of clothes can be washed at the same time, and a centrifugal wringer, both of which are driven by one of the steam-engines. From the wringer the washed articles are taken to the drying-closet, in which, by means of the heat, derived from the exhaust steam of the engines, passing through a large amount of cast-iron pipe, and fresh air from the fan, they are, in a very few minutes, made ready for the mangle—also driven by steam-power—or folded and taken, by the railroad, to the ironing-room, near the centre building, to which they are raised by the dumb-waiter, already referred to, or are sent directly to the principal clothes-room, from which they are distributed, by the same route, as they may be required in the wards. All the divisions of the washing-machine, and the rinsing and washing tubs, have hot and cold water and steam introduced directly into them; and the water from them all is carried off, under the stone floor of the room, to one of the iron columns below, through which it passes into the culvert, on the outside of the building.

COST.—Without a statement of the cost, no account of such a building, and such arrangements as have been described, would be at all complete, and especially not of one, like that under notice, which is entirely the offspring of the benevolence and liberality of a community, a result of practical Christianity, and a generous recognition of the paramount claims, which such afflictions of our fellow-men have, at all

times, upon our interests and our sympathies. The style of architecture is plain; and all useless ornament has been studiously dispensed with; but, wherever the comfort and welfare of the patients were concerned, everything has been done in a thorough manner.

The amount of money paid, on account of the building, and its varied fixtures and arrangements, up to the time when it was opened for use, was \$352,542.86. Of this total sum, \$30,276.28 have been for the boundary wall and gate-house, \$2,241.46 for the carriage-house and stabling, \$800 for the carpenter-shop, \$4,456.03 for machinery of different kinds, \$23,612.37 for heating and ventilating apparatus, \$15,201.47 for grading for building, planting, and improving the grounds, and \$10,441.73 for furniture.

SEPARATION OF THE SEXES.—Before closing this notice of the Department for Males of the Pennsylvania Hospital for the Insane, it may not be uninteresting to state, that the completion of this building allows the institution to carry out, under very favorable circumstances, what has, for many years past, been gradually gaining favor with some of the most experienced medical officers of American hospitals for the insane—a provision for the treatment of male and female patients in entirely separate buildings, and also to add that the results of this experiment have been eminently satisfactory.

THE FISHER WARD.—In addition to this detailed description of the Department for Males, we wish to give an account of the latest addition made to the Pennsylvania Hospital for the Insane, at its Department for Females, and which from the completeness of its general arrangements, and especially those for heating and ventilation, are well worthy of careful examination by all who are interested in these subjects.

This structure has received the name of "Fisher Ward," in honor of that liberal benefactor of the insane,—the late

Joseph Fisher, of Philadelphia, who bequeathed ample funds to build and furnish this ward in a most thorough manner.

The entire building is one hundred and twelve feet long, by twenty-seven and a half feet wide, and of two stories each, twelve feet in height. It is built of brick, is stuccoed, and has a slate roof. On the first floor, are a dining-room—with steam tables, and other conveniences, for keeping food warm, and cooking articles for the sick—a bath-room, water-closet, clothes-closets, and nine rooms for patients, each being about ten by fourteen and a half feet, whilst, in a few instances, two are thrown together. The rooms are on one side of a corridor, partly eight and a half and partly ten and a half feet wide, with two bay windows, projecting more than four feet, in each story. The second story has the same arrangement, with the exception that a room for two attendants takes the place of the dining-room. All the patients' rooms have a cheerful southern exposure, with large windows, the upper sashes of which are of iron, immovable, while the lower are of wood, and may be raised to their full height, having ornamental wrought-iron guards on the outside. All are glazed on the inside. There are Venetian shutters to all these windows.

WARMING AND VENTILATION.—Especially pains have been taken to secure a thoroughly efficient system of warming and ventilation, which the proximity of this new structure to the main heating apparatus gave particular facilities for doing. The heating is by steam; and the ventilation is forced by a steam-engine and fan. The fresh air supplied to the Fisher Ward, is taken nearly thirty feet from the ground, and passes down a brick duct, about three feet square, to a small room, whence it enters the fan, and is then driven, through an underground duct, to the main air reservoir, which occupies nearly the whole of that part of the north side

of the cellar of the building, which is under the corridor. On the south side of this cold air reservoir, are nine, and on the north side are three heating chambers, in which are placed box coils of steam pipe, the amount varying according to the space to be warmed by each. All are closely surrounded by brickwork, the air being admitted to each through openings near the ground, the size of which is regulated by sliding doors. The flues, from these air-chambers, pass into the corridors, and into every patient's room, opening near the floor. Each room has also a ventilating flue, with an aperture near the ceiling, and another near the floor, all of which are regulated by lock registers, so as to be under the control of the officers only. All the warming and ventilating flues pass up in the interior corridor walls, and the latter go into the attic, and there empty into an air-tight duct, which, plastered on both sides, gradually enlarges in a greater ratio than the area of the ducts it receives, passes to the central cupola, and thence into the external air. All the flues are made of terra cotta, rather more than three by thirteen inches in the clear, smooth on the inside, with round corners, and built in the centre of the wall.

The steam-engine is a horizontal one, of five horse-power; and the fan, five feet in diameter, is iron, of the Washington pattern, having sixteen blades. It is arranged for a free supply of air, and a free delivery; and, driven at a moderate speed, can be made to furnish a superabundance of fresh air at all times. Both are placed under the dining-room, and work noiselessly.

The water-closets have a strong downward ventilation, through fifty-seven feet of iron pipe and brick flue, leading into the main chimney-stack. Hot water is supplied from a boiler already in use in the eighth ward.

This arrangement for heating and ventilation is substantially that adopted at the Department for Males, and which

has now been working very satisfactorily for more than nine years; and is one, the effectiveness of which has been shown by abundant experience.

In regard to this subject of heating and ventilating hospitals, there are certain principles and facts that seem to me to be well established. Among these may be mentioned, as prominent, the following:—For many reasons, steam is the best agent for the purpose of heating. Fresh air should be passed over radiating pipes under the rooms, and then admitted into the wards in large quantities, moderately warm in winter, and cool in summer; direct radiation being employed only in a few locations, not constantly used; and as a help, perhaps, in very severe weather. All flues should be direct, formed in central walls, and made as smooth as possible. No ventilation can be regarded as worthy of the name, without some forcing power; and the force that is most available is, either a fan, or a heated chimney-stack, the former being preferable in most instances. Unless there are special reasons for a contrary course, it is best that the warm air should be admitted near the floor, while the ventilating flues should have openings, under control, both near the ceiling and not far from the floor; the latter to be used when it is important to save heat. If there really were any gases too heavy to ascend, inside of a room, to the opening of the flue, near the ceiling, where the air is necessarily warmer, than at the floor, they would hardly rise in a flue, the temperature of which is gradually becoming lower, as it ascends. The difficulty can be obviated, only by the introduction of heat, either directly or indirectly, into the flue itself, or at some point into which it empties. The fan, however, is the great and best regulator of all this. No matter where the openings are made, or even if the flues are cold, the change of air is inevitable; the intermixture of that driven into the room, with that already there, being

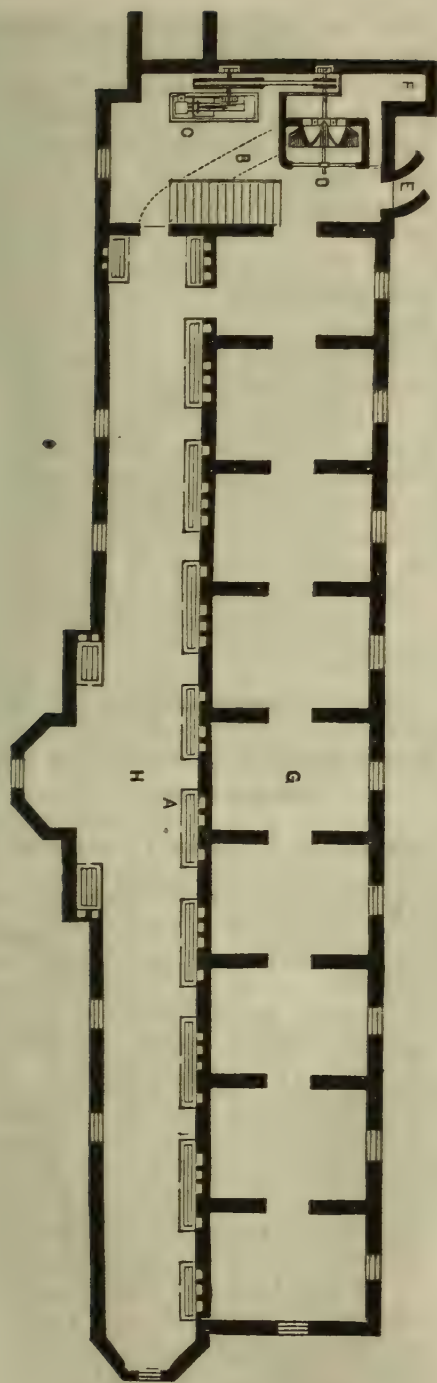


FIG. 3.—PLAN OF THE CELLAR.

A. Hot-air chambers, containing coils of steam-pipe directly beneath flues. B. Cold-air duct beneath floor. C. Steam-engine. D. Fan. E. Passage to boiler-house. F. Vertical duct supplying fan with air. G. Cellar. H. Cold-air chamber.

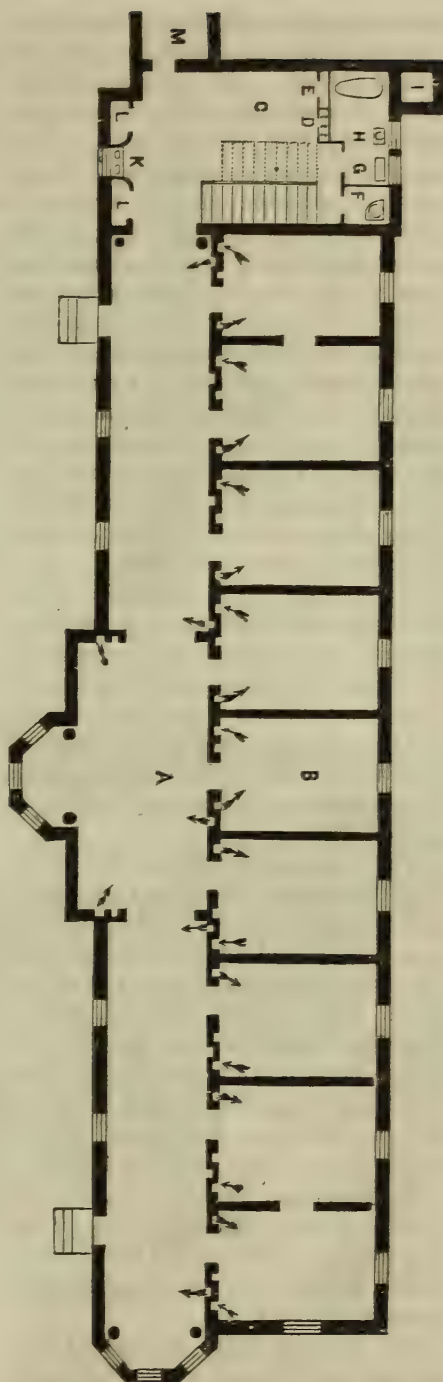


FIG. 4.—PLAN OF PRINCIPAL STORY.

A. Corridor. B. One of patient's rooms, with arrangement of flues. The arrows indicate the course of the air. C. Dining-hall. D. Wicket-door. E. Closet. F. Water-closet. G. Sink. H. Wash-basin. I. Cold-air shaft. K. Warming-table. L. L. Closets. M. Connection with eighth ward.

much more thorough, in every spot, than, without experiment, could have been believed possible. All attempts to ventilate, without using heat, and, of course, consuming fuel, of some kind, as the agent producing this heat, must be failures. Ventilation in cold weather is necessarily loss of heat; but, at the same time, nothing is more certain, than that no expenditure, about a hospital, can be more wise, or more truly economical, than that which secures, at all times, to every one within its walls, that, without which, perfect health cannot long be maintained; an abundance of pure air, at a proper temperature—one of the blessings which a beneficent Providence intended every living being should have during his whole existence.

Many of the great difficulties, about warming and ventilating, of which so much is said, have arisen, in great measure, from efforts to get more heat out of fuel than is in it, and to ventilate without losing any portion of the heat that is obtained—all of which efforts, as has been already said, are very certain to prove failures.

The work on the "Fisher Ward" has been thoroughly done, in every part; and the entire cost for building, furnishing, heating, and ventilation, including the steam-engine and fan, and for all other fixtures and arrangements, is \$24,850, or \$150 less than the first estimates concerning all these objects, those for the building being a little more, and for the furniture and other fixtures rather less, than originally estimated.

In conclusion, we may state, that the results of ten years' experience of fan ventilation, as arranged at the Pennsylvania Hospital for the Insane, gives these conclusions:

1st. That the same amount of pure air, can be delivered by that means, at as little cost as by any other, and with more certainty and uniformity.

2d. That there has been no practical difficulty in the arrangement of flues, or openings, for, as they were started in

1859, so have they, almost without change, remained ever since.

3d. That there has been no difficulty from draughts or stoppage of flues, nor has there been any indication of unpleasant sensations, from the fan forcing more air into rooms, than could readily escape.

4th. That no more help is employed, than there would be, if there were no fans used.

5th. That it is perfectly independent of atmospheric conditions.

In the preparation of the foregoing notice of this great institution, the result, almost entirely, of the liberality and benevolence of the citizens of Pennsylvania, we have drawn largely from the valuable reports of Dr. Kirkbride, who has, from its opening in 1841, been its chief medical officer and Superintendent.

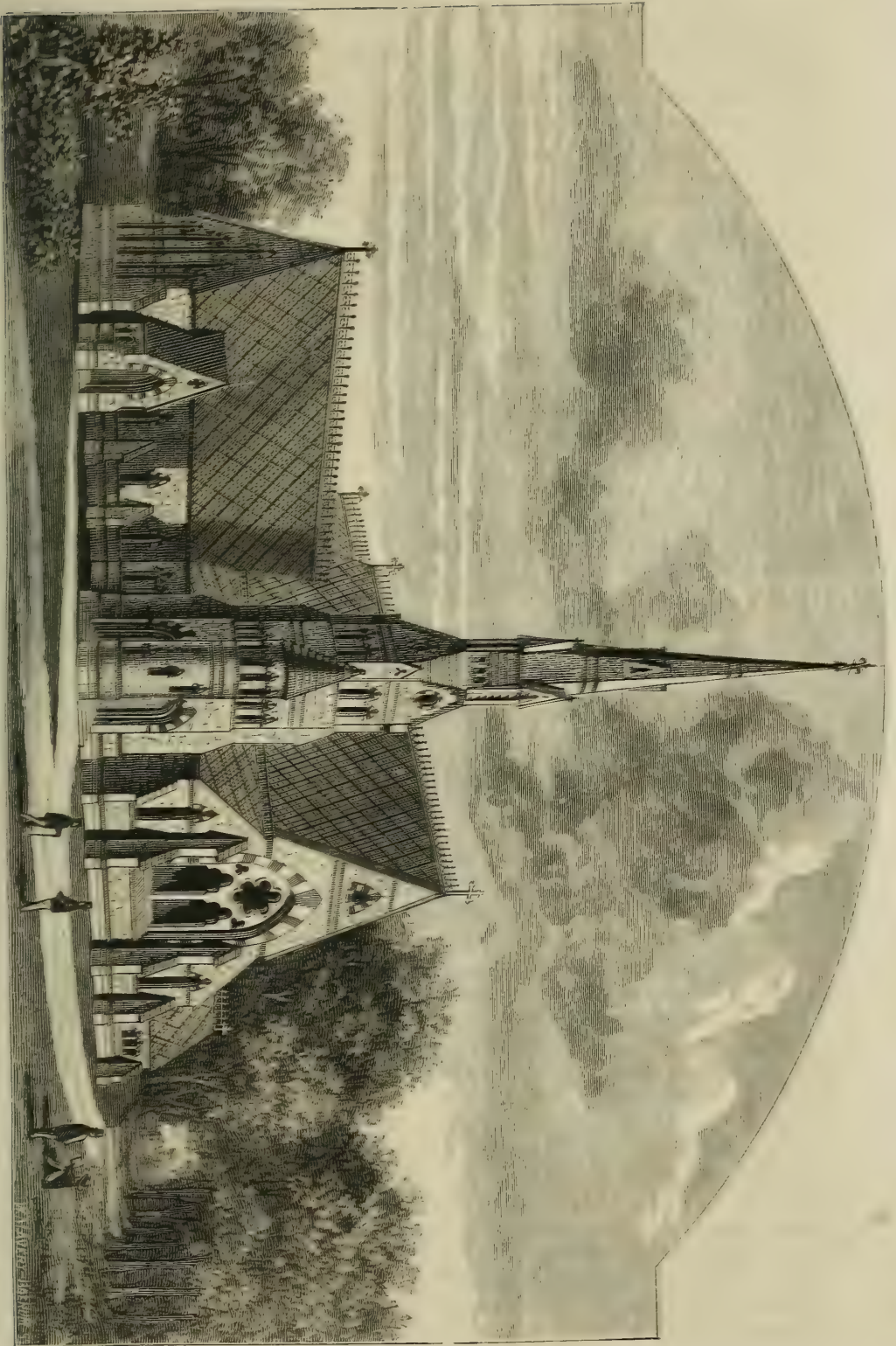
CHURCH OF THE GOOD SHEPHERD.

ARMSMEAR, HARTFORD, CONNECTICUT.

AT ARMSMEAR, near Hartford, Connecticut, MRS. COLT, WIDOW OF THE LATE COLONEL SAMUEL COLT, has erected to the memory of her husband and children, a church for the use of the armorers and their families, and others employed on the estate, a very neat little Gothic Church, called THE CHURCH OF THE GOOD SHEPHERD. The designs are by Mr. EDWARD T. POTTER, Architect; and embrace a Nave and Aisles; Chancel, with arrangements for a Choral Service; Sunday-School, opening out of the Church as a Transept; Baptistry; Organ-Room and Vestry; and a Tower and Spire.

The walls are of Portland brown-stone, relieved with dressings of Ohio stone. Around the semicircular Apse of the Sacrarium, which terminates the chancel, is carried an Arcade of thirteen lancet windows, filled with stained-glass,

THE CHURCH OF THE GOOD SHEPHERD, ARMSMEAD, NEAR HALTFOORD, CONNECTICUT.





bearing figures of OUR LORD and the TWELVE APOSTLES, after the designs of Overbeck. The Arcade is decorated, externally, with alternate polished shafts of red and black granite, standing free, whose capitals are carved with olive foliage and the appropriate apostolic symbols.

The Church has an Open-timbered Roof, of polished chestnut, novel, but beautiful in design, illuminated with gold and vermillion.

Rich Borders, with texts and other decorations in color, are introduced in the interior. The Baptistry and Organ-Room, on either side of the chancel, open into it, and into the church, by

Arches. Those in the chancel are carried on polished red columns, with white marble capitals, carved with water-lilies.

The design of the Font—suggested by Mrs. Cox, and being carried out by Mr. MORGAN, Sculptor—consists of THREE CHAMBRAN, supporting a SHAPE, executed in white marble; and is intended as a memorial.

At the west end of the Church, is a large Memorial Window, of elaborate design and beautiful coloring, which—as well as the other windows, all of which are filled with stained-glass—is by Mr. SHARP.

We now introduce, as above, an engraving of the Screen, which divides

the Sunday-School from the Church. It is made of chestnut wood, like the wainscoting, pews and furniture of the Church, some of which is richly carved. The screen is filled with plate-glass; and can be opened, or closed, at pleasure, uniting, or separating, the Church and Sunday-School. Similar, but smaller screens, are introduced in the arches of the Organ-Room and Baptistry.

Among the carvings which adorn the exterior, perhaps the most interesting are those of the south porch, the Armorer's Porch, as it is called. Under the symbol of the Cross, and half concealed in foliage, are representations of the different parts of all the fabrics, in making which the workman's days are spent. Around the entrance-arch is carved this text: "Whatsoever ye do, do all to the glory of God;" words which are, for those who placed them there, or those who read, at once an admonition and a prayer.

DESIGN FOR A SOLDIER'S MONUMENT.

THE accompanying illustration exhibits the design for a Memorial Monument, or Military Testimonial, by Mr. B. S. DE FOREST, Architect, Clinton, Iowa, to be executed, there, in marble, quarried in the neighborhood.

The style is Gothic. The plan covers a platform 13 feet square, raised on four steps; and the total height will be 26 feet. The first step is 2 feet 6 inches wide. On its corners are four pyramids, formed of carved cannon balls, in black marble. On the corners of the second step, which is 2 feet wide, are octagon pedestals, with statues representing soldiers of different arms of the service. The one on the right is an Engineer, map in hand; that on the left, a Private of Infantry; the one on the northwest corner is an Artillery-man, holding a ramrod, while that on the southwest corner is a Colored Cavalry-

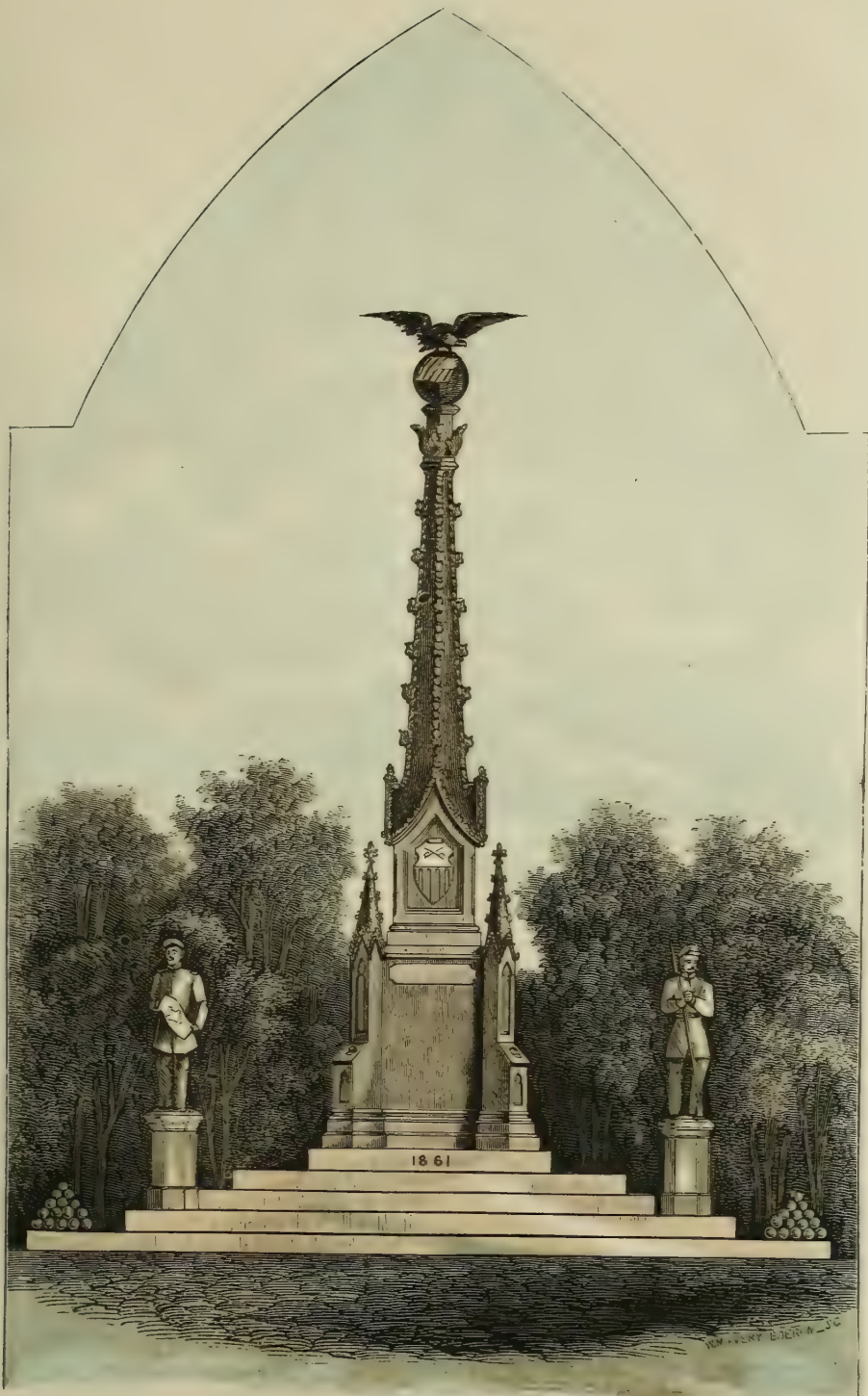
man, with drawn sabre, and broken chains at his feet, emblematic of the freedom he gained, as a consequence of the great Civil War. On the platform, which is elevated on two other steps, is a sub-base 7 feet square, on the east side of which is inscribed the memorable date, 1861, when the Rebellion broke out. On the north front is 1776, suggestive of the War of the Revolution, which gave Independence to our whole country. On the west front, 1812 reminds us of our second successful encounter with Great Britain. And on the south front appears 1846, the year of our glorious Mexican War.

The first section of the monument is the pedestal, which comprises the base, tablet, and cornice. At the angles are diagonal buttresses, crowned with crocketed pinnacles and appropriate finials. On the copings are fatigue caps.

The inscription slabs contain fifty-six superficial feet of surface; sufficient for one hundred and fifty names. The sides of the buttresses may also be used for names, if required.

The second section comprises a base, die, and gabled cornice, finished with crockets and finials. The body will be neatly paneled, having shields, crossed sabres, and thirty-four stars on the east front, all in relief. On the north front the devices will be a tent, stack of arms, camp-chest, picks, shovels, and cannon, and thirteen stars on the border of the shield, all in high relief. The devices of the west front will be a castle, drum, bugle, fife, and sword. On the border of the shield will be eighteen stars, all in relief. The south front has the coat-of-arms of the State, with its shield surrounded with thirty stars, all in high relief. The number of stars indicating the States in the Union, when Iowa first made one.

The third section is a quadrangular shaft, finished with crockets and finials. On the apex is a Globe, supporting an Eagle, with extended wings, carrying the American Flag, which overshadows



DESIGN FOR A SOLDIERS' MONUMENT.

BY B. S. DIFOREST, CLINTON, IOWA.

the Western Continent, emblematic of our country's future greatness.

It is intended that the grounds shall be enclosed with a chain, supported by cannon-shaped posts, thus adding to the military effect of the whole.

The design is unique; and we should think, that it must present a very pleasing appearance, when erected.

A BRACKETED COTTAGE.

THE design we have here depicted is of a very simple form. It consists of a Centre, twenty-seven (27) feet long and twenty-nine (29) feet deep, with two stories and a finished Attic, and a Wing on each side, either being twelve (12) feet square, in the clear. These Wings are one story, with attic rooms above. One of the Wings is intended as the Entrance Hall, and the other for the Kitchen. Each has its Chimney on the outside, leaving spaces for the rooms, etc., clear.

The Entrance Door is sheltered by a neat Porch. There is another Porch, or Verandah, extending along the entire front of the Main Building, which is entered from the Piazza through the Windows, which extend down to the floor.

The Parlor is twelve (12) feet wide by twenty-five (25) feet long, having, in its rear, the Dining-room, twelve (12) feet by fifteen (15) feet, with the Stair-hall on one side, and the Pantry and China Closet on the other.

The Kitchen is shut off from the Dining-room, by two doors, which form a Lobby, whence the Pantry is entered.

The Dining-room and the Parlor communicate by folding-doors.

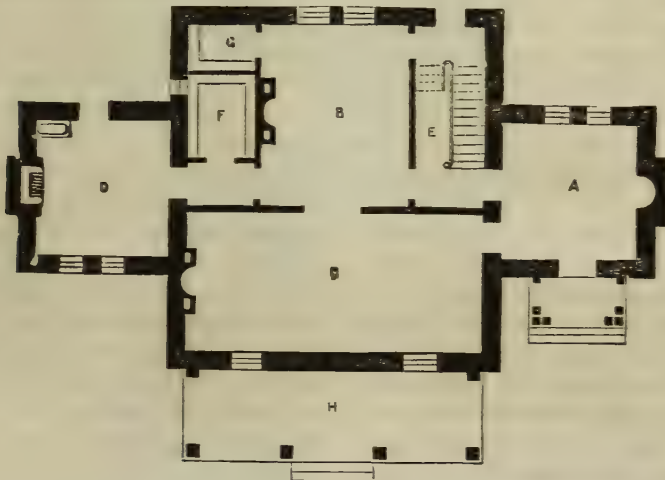
The second story has two Chambers over the Parlor, a Bed-room over the Dining-room, and a Bath-room over the Pantry, with a Passage along the centre partition whence all the apartments are entered.

The Attic is similar in its arrangements.

The whole scheme gives five rooms on the ground floor, as many in the second story, and three in the attic, or thirteen in all, which will readily accommodate a family of eight persons.

This projection, economical, in every respect, has all the medium conveniences for a dwelling of its grade; and could be erected for the sum of four thousand five hundred dollars.

The construction should be of stone; roofed with slate; and if the latter were varied in pattern, with a slight mechanical mixture of color properly dis-



tributed, it would not add materially to the expense. The crest of the roof should be tipped with light bronze.

The stone in the walls, light gray in hue, should be laid as promiscuous rubble-work, pointed with mortar one shade darker.

The Woodwork of the exterior may be finished in oil, mixed with a slight portion each, Venetian red, and ochre, leaving it the color of oak, or yellow pine. Of this compound, three good coats should be given. The sashes and window frames may be similarly treated. The front door may be of cherry-wood oiled.

The interior of such a Cottage should be finished with yellow pine and chestnut; the dressings of the former, and the doors and stairs of the latter. The exceptions are the newel and hand-rail, which should be of walnut; and the balusters of some lighter and brighter wood, say dog-wood, maple, or birch.

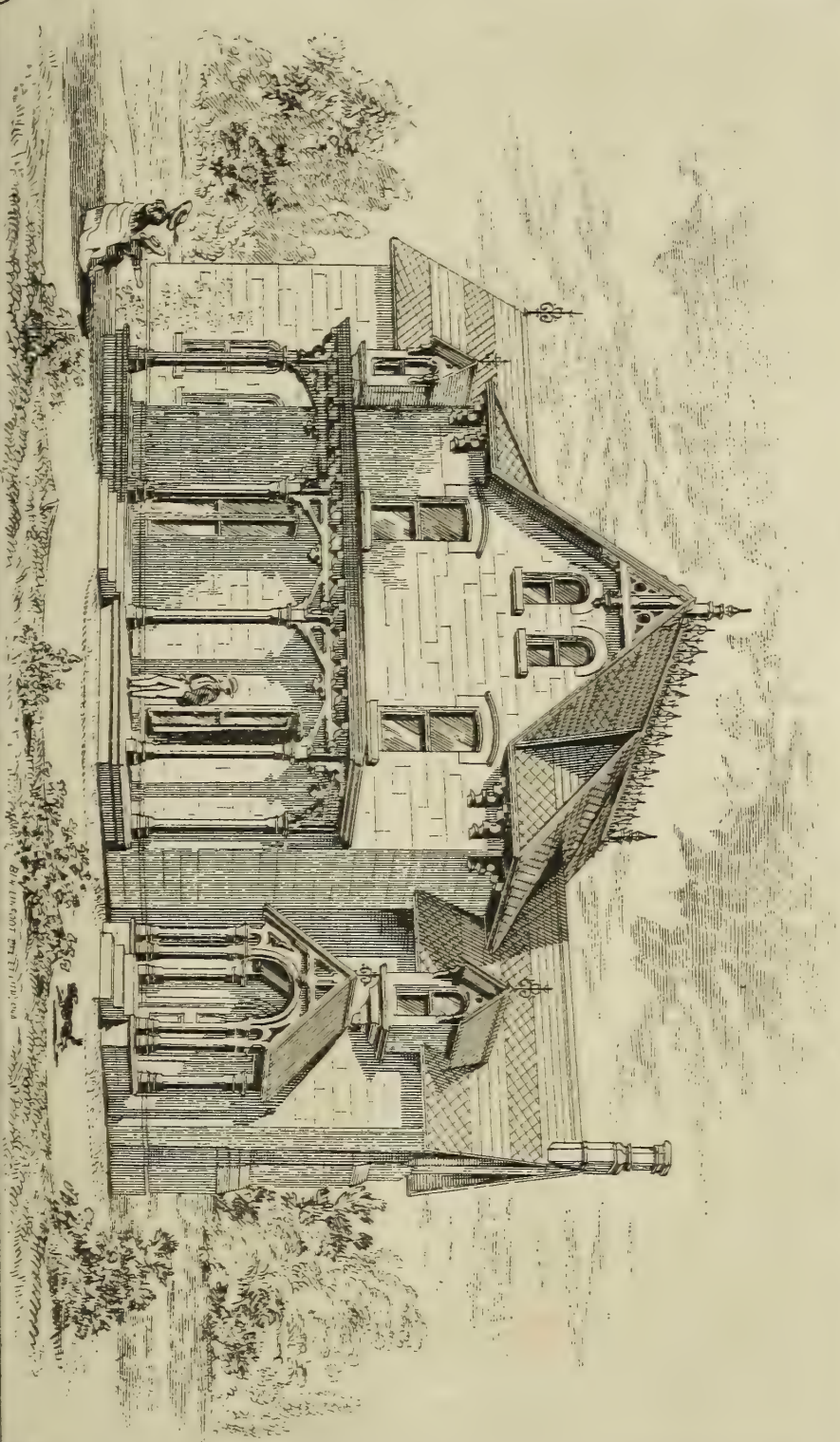
This Cottage Ornée has a peculiar piquancy of taste, arising from its being covered by a hip roof, whence diverge four gables; the front and back ones of the main attic and those of the wings; the four oriel dormer windows of the two latter front and back, cutting the eaves, and protected by canopy-gablets, the pendent-posts of the main gables, the varied outlines of the window-heads, the buttressed chimney, with its terra cotta top; its simple base rising a little higher than the floors of the piazza and the entrance porch, the latter itself with its twin pillars and twin pilasters on either side, its semi-circular interior sweep, corresponding with the architrave of the doorway, closed by two plainly-paneled folds; and its gabled rooflet, with pendant post, harmonizing both the head and foot-lines of the oriels, the side brackets of the main building, its hip-roof and front gable, and the angular open-work of the verandah eaves—all which, coherent, quiet, and neat, produce a feeling of modest but thorough content.

COTTAGES.

ACCORDING to country and sub-urban usage, the term Cottage, means a house of modest pretensions, varying much in size and accommodations. In fact, it includes dwellings of all dimensions, from a hut to a villa, excluding the extremes, and any number of rooms, from two up to a dozen. In city parlance, the word Cottage is applied to a tenement varying in its bulk and apartments, as before, generally plain in exterior, but often neat and occasionally ornamented, set upon one side of a lot; and far enough back, from the street, to enable a higher and more stylish front, or main, building to be erected, by the owner, upon "the line," at some future period, when the original cottage becomes the ultimate back-building.

Amongst active business men, and investing capitalists, opinions vary, and always will and should, concerning the wisdom of the entire investment of a man's means in landed property, either vacant or improved; and, in fact, were all men to speculate in any one direction, the result would ever be disastrous.

However, shrewd observers remark, that only those families remain rich, from generation to generation, whose managing members are careful to invest most of their capital in farm land, situated from one to eight miles beyond the paved streets of prosperous cities and towns, while from two to four miles is preferred; and, in the *directions of growth*, which, in the United States, is always understood to be anywhere from northeast around to west, and up stream, no matter what direction that may be. It is true, that unimproved land all around the compass may, and often does, pay handsomely, if near an improving mart, but the points first noted are always the most encouraging. Yet, to obtain the extreme of profit in this branch of investment, requires great forecast and commensurate patience; the children, in



COTTAGE IN THE BRACKETED STYLE

turn, reaping what the parents have sown, and selling, or renting, by the foot what the family purchased by the acre.

On this account, the mass of moneyed mankind not engaged in agriculture, always throw their capital and energies into the active pursuits of business, manufacturing or mercantile, because while the risk is far greater, the immediate profit, if any, is much more.

There are not wanting those, who contend, that it is much better for the young business man to rent, rather than buy, as his limited capital will make for him a larger interest, actively employed, than it can possibly save him in a house; and if every man's ideas were set upon a home quite beyond his means, though possibly far within his wishes, this position would assuredly be correct. But nearly all admit, that the beginning of prosperity to any man, settled in life, consists in owning the house he lives in. Apart from any other consideration—and there are many—the fact of ownership, from its augmented security, confers additional happiness upon the whole family. They then first really become a household, because they *hold the house*, in the sense of possessing, not renting it; and the house itself actually becomes a home. A thousand little improvements are then made, by father, mother and children, which would never even be thought of, much less done, in a residence merely leased.

It is this innate tendency of human nature that led Scott, in his younger days—as he humorously mentions in one of his prefaces—so to appreciate the wit of an almanac—of the time of Charles II., “when all publications, even to almanacs, aimed to be smart”—recommending “every man to walk at least a mile every morning before breakfast, for the benefit of his health; and, if possible, to do it upon his own ground”—that landed proprietorship became one of the great objects of his life

This general feeling is by some individuals carried so far, that, they get comparatively very little satisfaction out of the best books, unless they own them; and, in fine, it is the grand lever moving the world. Take away the hope of attaining real property and you take away all genuine love of liberty. The tyrants of the world, in all ages, have so well understood this, that their first seizure was invariably the ownership of the land at large, to be held of them, by the few, for military and civil service; and forever to be withheld from the many. Sacerdotal establishments, ostensibly secondary to the kingly, but often superior, have always been fastened measurably upon the soil, to say nothing about the tithes from the products of the lands of the people. Among the laity, primogeniture, or the right of the first-born son, has secured accumulation in all the countries of Europe, except Wales; and there gavel-kind, or equal distribution of the land between all the children, caused interminable wars of selfishness, for aggrandizement; because the Welsh were vitiated by the doctrine of all the land for the eldest son, as held by all the nations around them. But, in a country like the United States, where gavel-kind is a portion of the people's primer, we see its beneficent effects. Here no extent of possessions is honorable, unless held by equitable descent, or amassed by legitimate personal effort. That which the individual has fairly earned, let him freely enjoy and transmit.

Not intending a lecture on political economy, we return to our cottages. All understand, of course, that the practical builder, from familiarity, both with the plans of architects, executed by himself, in many previous instances, and the locality and rate of materials, would be at no loss, with regard to the elevation of an absolutely plain small structure, of routine style. If the projector has any special taste to gratify, or want to meet, he had better get the advice of

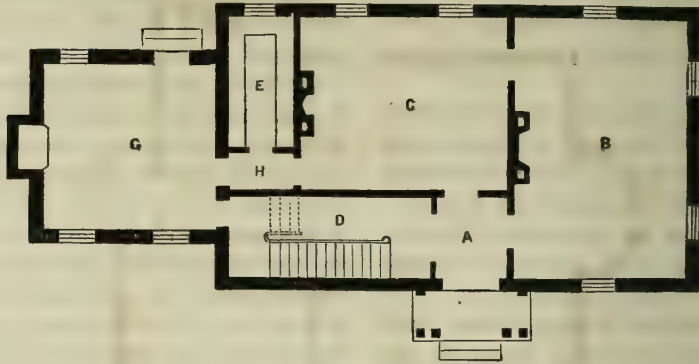


FIGURE 1.

an architect to guide his builder. It is obvious, also, that many front and side elevations can be adapted to the same plan; and, as in these moderate attempts to secure an estate, the aspirant will oftener, probably, think more of room and comfort than style, on this occasion we omit the elevations, in order to multiply the plans.

We might remark, in passing, that, these proposed domiciles are all adapted to the country. On a future occasion, we shall produce a series intended for both suburban and urban requirements. Our description comprehends four different plans, for as many separate cottages.

FIGURE I,

the largest of the number, is regular in outline. Its arrangement adapts it to a corner lot, as the entrance is on the side, with the parlor across the front.

The Vestibule A, seven (7) feet deep by six (6) feet wide, proceeding from the right, affords egress, on its three sides, respectively, to the parlor, the dining-room and the stair-hall.

The Parlor B is fifteen (15) feet wide and twenty-two (22) feet long. The Dining-Room C is fifteen (15) feet wide and twenty (20) feet long. The Stair-Hall D is seven (7) feet wide by twenty (20) feet long, with a door, at the rear end, communicating with the Kitchen G, in the addition, fourteen (14) feet square, with the chimney on the outside.

This increases the interior dimensions of the dwelling.

In the body of the house, and between the dining-room and the kitchen, is the Pantry E, six (6) feet wide and ten (10) feet long, well shelved, and lighted by a window at one end.

The Second Story will afford the same accommodations; or, if desired, the rooms can be partitioned, and one or two additional apartments thus obtained.

The Bath-Room will be over the pantry, for convenience of access from the hall, at the half-landing of the stairs. There is likewise economy in this arrangement, the water-pipes being all concentrated and carried up inside the pantry, so that, in the event of leakage, there can be but little damage done to any part of the premises, as the water would most likely confine itself to the bath-room above, and the pantry below.

A house thus arranged needs but one staircase, as the latter is shut off, by the vestibule doors, from any exposure, either at the entrance, or exit, of inmates or guests.

The front-door can be approached from the kitchen, through the stair-hall, without any of the rooms of the lower story being used as a thoroughfare.

The dining-room is shut off from the kitchen by two doors and a passage-way H, six (6) feet long.

This dwelling can easily be increased by another story, if desired; or may



FIGURE 2.

have its sleeping-rooms within a Mansard roof, or an ordinary attic.

A design can readily be attached to the plan, affording ample accommodations for a family of from six to eight persons, at a cost not exceeding \$3,500.

FIGURE II

is a plan, with broken outline, of about the same dimensions as Figure I.

A is the Vestibule, six (6) feet by six.

P is the Parlor, fifteen (15) feet wide by twenty-four (24) feet long, with a spacious bay-window on the side.

C is the Dining-Room, fifteen (15) feet by eighteen (18) feet, with a bay-window, projecting three (3) feet, on the front.

D is the Hall and E the Stair-Hall.

F is the Kitchen, twelve (12) feet square.

G is the Pantry, six (6) feet by six, opening from the kitchen and provided with a window.

The communication between the Dining-Room and the Kitchen is across the stair-hall, beneath the stairs. This passage will be shut off from the stair-hall, by means of screen-doors, which will also form a sort of Vestibule for the Side Entrance of the Stair-Hall.

H is the Front Porch. The Side

Porch is unlettered, as is, also, the Rear Doorway to the Kitchen.

This place is somewhat more expensive than Figure I, owing to the broken outline of the ground-plan, the two bow-windows, and the enlarged porch. As the other, it can be arranged in elevation, for two, or three stories; and, if extended, to accommodate a family of six or eight persons, would cost about \$3,800.

FIGURE III

is much smaller, than either Figures I or II. The Parlor B and the Dining-Room C, communicate by Sliding-Doors.

A is the combined Entrance and Stair-Hall, six (6) feet wide. B, the Parlor, is fourteen (14) by sixteen (16) feet. C, the Dining-Room, is fourteen (14) feet square. D, the Kitchen, is twelve (12) feet square. E, is the Kitchen Pantry, and F the Dining-Room Pantry. G is the Passage from the Kitchen to the Dining-Room, shut off from the Stair-Hall by glass doors. H is the Front Porch.

An elevation can be designed for this plan, affording accommodation to a family of four persons, at an expense of \$2,200, and, for a family of six, to cost \$2,800.

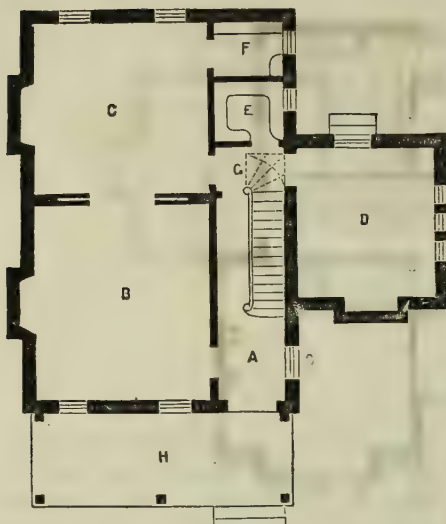


FIGURE 3.

FIGURE IV

is a plan equal in dimensions to Figures I and II; and would naturally call for greater style in its exterior, than any except the latter. Like both Numbers I and II, it can have an elevation of

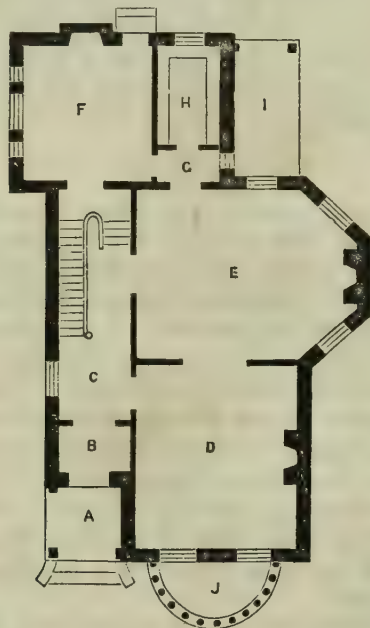


FIGURE 4.—First Story.

either two or three stories, according to the wants of its occupant.

First Floor: A is the Entrance Porch.

B is the Vestibule, five (5) feet long by six (6) feet deep. C is the Stair-Hall six (6) feet six (6) inches wide.

The Parlor D is fifteen (15) by eighteen (18) feet, having a semicircular Balcony J beneath the Oriel, of the second story.

The Dining-Room E has a half-octagonal end; and is twenty (20) feet long and fifteen (15) feet wide.

The Kitchen F is twelve (12) by fourteen (14) feet. G is a Passage-Way between the Kitchen and the Dining-Room, and is also the Back Vestibule communicating with the Rear Porch I. H is the Pantry, well shelved, and provided with one window. Beneath the Stair-Way, the Kitchen opens directly into the Stair-Hall.

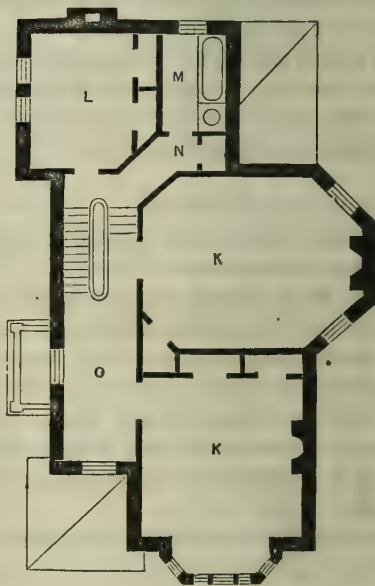


FIGURE 4.—Second Story.

Second Floor: O is the Stair-Hall. K K are Chambers, respectively over the Parlor and the Dining-Room, and nearly of the same size; the square front one having an Oriel Window and two spacious closets, and the back, or octagonal one, being provided with one large single closet. From the Half-Landing of the Stairs, a door opens into a very snug Bed-Room L, with two fine,

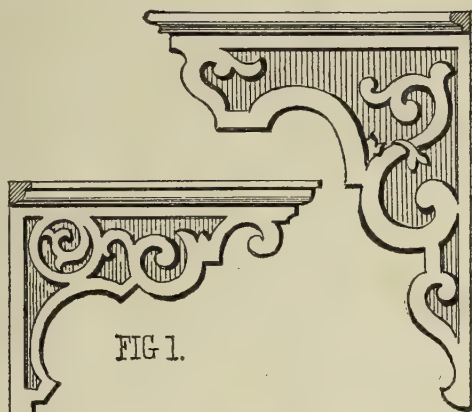


FIG. 1.



FIG. 2.

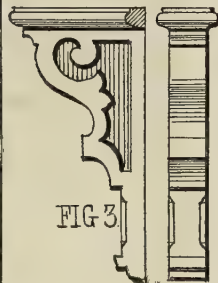


FIG. 3.

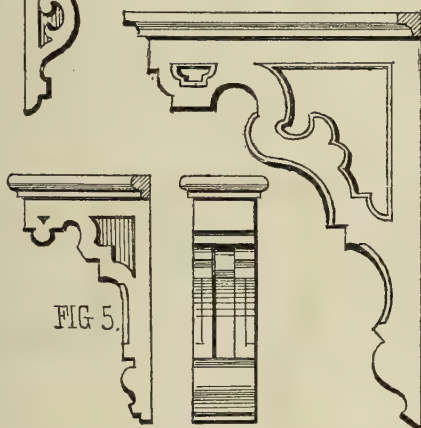


FIG. 5.

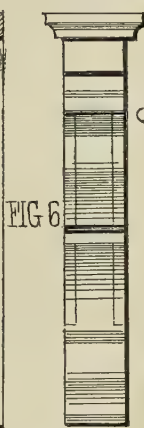


FIG. 6.

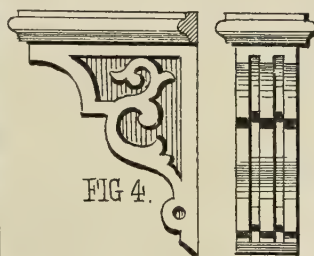


FIG. 4.

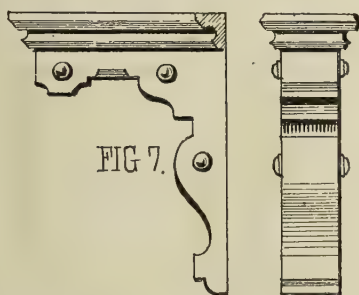


FIG. 7.

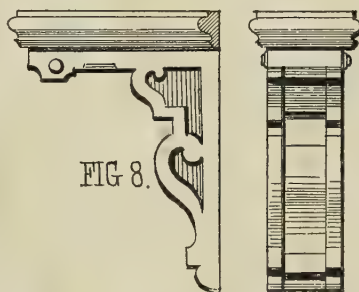


FIG. 8.

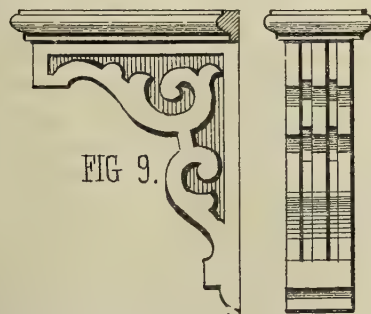


FIG. 9.

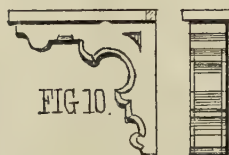


FIG. 10.

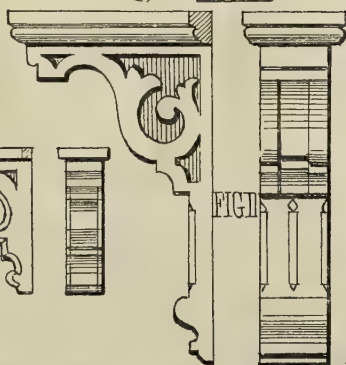


FIG. 11.

deep closets; and a diagonal Passage N gives access, on the right, to the Water-Closet, and, on the left, to the Bath-Room, which contains a lavatory.

If a third story were desired, it could be arranged for four, or even five, snug Bed-Rooms, under a Mansard Roof.

According to the style of Roof, and, the finish of the upper stories, this very comfortable little Residence would vary in cost, from \$3,500, to \$4,000.

For the convenience of our readers, longing to obtain a Land-Hold and a Homestead, we shall return to this general theme repeatedly, until they are well grounded in the simple Elements of Design, as Applicable to the Erection of Neat Little Homes.

BRACKETS.

THE Modern Domestic Style is greatly enhanced in effect by the use of CANTILEVERS and BRACKETS. The latter, especially, often appear beneath eaves, balconies and door and window pediments. Both embody the idea of support, but the first is ostensibly better adapted to light weights and the last to heavy ones.

From their common main principle, Cantilevers and Brackets should always be composed in easy flowing lines, suggesting elastic strength. Although costing the practical workman more trouble, both in drawing and execution, these curves will have a much finer effect, if comprised in harmoniously united portions of ellipses than parts of circles. It is herein that the creative artist will ever be distinguished from the merely imitative artisan.

To brackets belong all those beautiful effects which nature gives us in the flowers. In fact, the leaves of the bracket are as much intended to represent the graceful curls and curvatures of leaves, as are the same in the Corinthian capital. It is, therefore, to be kept in view

by the designer of the bracket, that those carvings which present the forms he desires to produce, are typical of the leaves which cling around the supporter of the cornice. Bearing this in mind, then, it becomes necessary to imitate nature as nearly as possible, and should the bracket come so near to the observer's eyes as to warrant a representation of the *veining*, it would add much to the general effect to carve them in. But if they are too distant to be easily discernible, of course, they would be labor thrown away.

The thickness of the bracket should so agree with its other dimensions as to give it an unquestionable appearance of strength as a support; and, at its springing point, it should be so arranged as to look as though it came forth from some other member, and still had its chief reliance there. This starting-place should be a string-course continued across the breadth of the building having the brackets; as all of these are intended alike to sustain one common object, they should, accordingly, all spring from the same continuous level.

Sometimes this string-course is designed as a binder, and is carried around the bottom part of the brackets a little above the springing-point; and sometimes the string-course is itself supported by blocks, which coming exactly under the locations of the brackets, give the effect of being part of them.

The usual mode of making brackets, or cantilevers, of large size, is to cut them separately out of stuff of the necessary thickness; and to nail them together. Thus, suppose six inches to be the thickness called for—then, two outside pieces of one and a half inch, and two of less projection, each also one and a half inch in thickness, (making three inches,) would complete the required amount of stuff. And each piece being sawed out according to pattern, will fit exactly into its place, and when all are secured together, the bracket is formed, and will only require a little planing

and sand-papering to prepare it for the brush of the painter.

Cantilevers will not bear piercing to any extent on account of their habitual slenderness of side profile. Brackets, on the contrary, are often pierced in wood, and always in metal. Wooden brackets being cut, by machine saws, against the grain, no real weight should ever be imposed upon them. The solid-centre wooden bracket, with relief ornaments on both sides, will appropriately admit more ornamental saw curves than the open one, for this reason, evidently, the ornamental work will be more permanent. In practice, however, this consideration has very little force, because the architect or builder thinks he really needs more linear beauty in the open bracket than in the closed one.

The accompanying plate represents eleven different DESIGNS FOR BRACKETS, adapted to what is already known in Europe, and fast becoming so here, as THE BRACKETED STYLE, always introduced when extensive projections of the cornices are required.

Figure 1 exhibits only the profile, the face, or end, being omitted. It has a solid centre, or core, two inches thick, with the scroll-work, sawn from one inch stuff, projecting, say, from one-half to five-eighths of an inch beyond the front edge of the core, or, in other words, the profile of the core will recede from that of the outer scroll. This will obviate the opening of the joints, from seasoning, and remove the plain appearance of a flat surface from the body of the bracket.

Figure 2 is a design intended for a more massive structure, or a cornice of greater bulk, than that just instanced, although its construction is the same. Its side indicates a little carving, not employed in Figure 1. Its face is given.

Figure 3 is a bracket of small size, adapted more particularly to the eaves of porches, or any feature of a height not exceeding one story. Both side and face are presented.

Figure 4, similar to Figure 3, with greater projection of face, is suitable for a second story. The method of making it is the same as with Figures 1 and 2. We give both side and face.

Figure 5, a small bracket for porches, bay-windows, &c., needs no special remark. Both views are shown.

Figure 6 is an Open Bracket, meant for great projections; and may be extended for overhanging eaves, to the covered ways of railroad stations, &c.

Figure 7 is a Solid Bracket, which may almost be termed a Cantilever with a Bracket beneath it. The sides are studded, the ornaments being thus in relief. Both side and face are drawn.

Figure 8 is another Cantilever-Bracket, with open work in the lower section. Its construction is like that of those above. The drawings show both side and face.

Figure 9, though not so decided a compound, bears the same appellation as the last, from which it differs chiefly in having its pierced-work extended throughout its sides. This example is in five sections. There is a double core that recedes, forming two channels, instead of one, in the face, which is likewise displayed.

Figure 10 is a small example of Cantilever-Bracket for light verandahs and other such structures. It is made from three-inch plank. The form is plain, with a chiseled depression on each side of its body and chamfered edges. Both its face and side are here produced.

Figure 11 is a Bracket that may be used at the height of two stories or upwards. It should be increased in size according to the altitude of its presentation. In addition to the scroll-work, the edges of its lower straight member are chamfered, and the face between channeled in a straight line by the gouge. The side and face both appear. This general form admits many elegant variations, as, indeed, do all the figures upon the plate.

There is no country in the world in

FIG. 1.

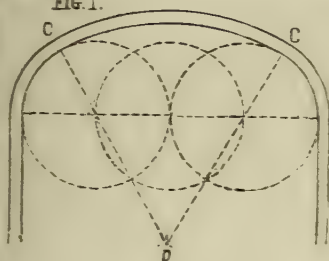


FIG. 2.

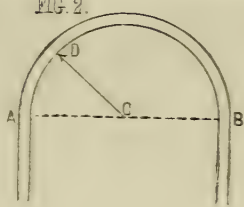


FIG. 3.

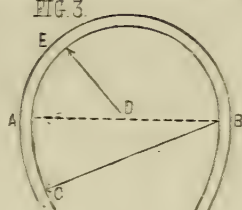


FIG. 4.

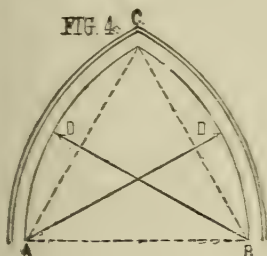


FIG. 5.

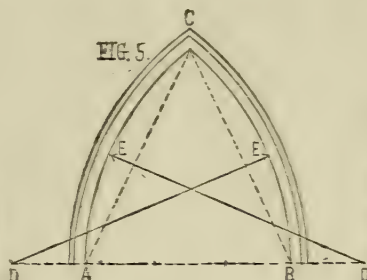


FIG. 6.

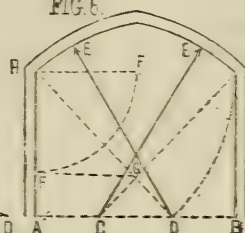


FIG. 7.



FIG. 8.

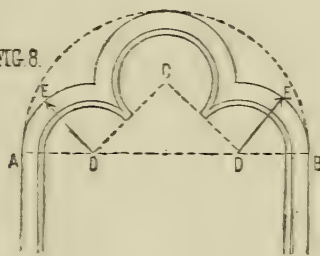


FIG. 9.



FIG. 10.

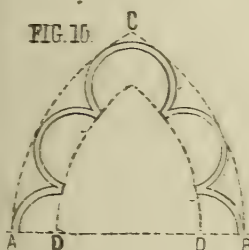


FIG. 11.

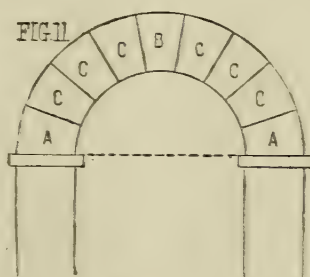


FIG. 12.

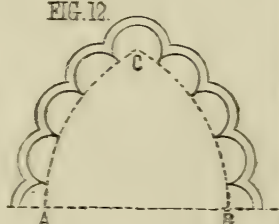


FIG. 13.

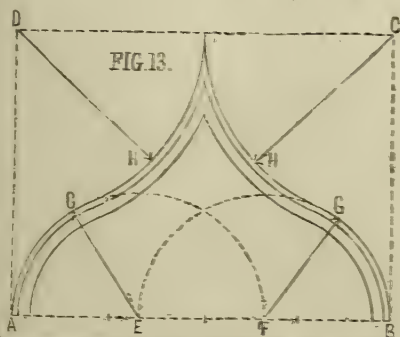
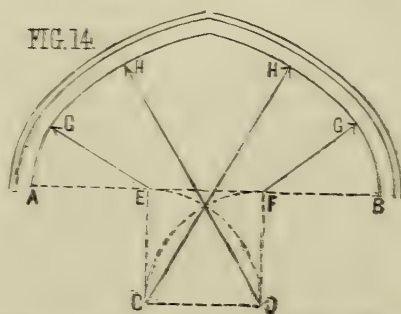


FIG. 14.



which the bracket and cantilever are so much in use amongst architects as this. And, such is their intrinsic value, as features in design, as well as supports, that there is no prospect whatever of their dropping into disuse. To them we owe the great superiority of effect of our domestic architecture over that of other nations; and, so long as wood continues to be plentiful, the skill of our

carpenters will always be in requisition with respect to them. Therefore, it becomes a necessity for the young practitioner to be, not alone informed as to what is and has been the practice in the formation of these very useful as well as ornamental appendages, but to seek and study out new outlines of shape, and fresh ideas of beauty, to make them all that they are capable of being made.

GEOMETRY IN ARCHING.

THERE is a wide divergence of opinion, with regard to the nativity and paternity of the ARCH. Who devised this cunning and most useful feature in Architecture, or where it had its birth; are alike tantalizing questions, to the archæologist. We claim a right to our opinion; and will freely give it in favor of Etruria, of which country Tarquin, King of Rome, was a native, and, as he used the arch in the formation of the *cloaca maxima*, or main sewer, of that city, and employed Etrurian workmen, for the purpose, the presumption is very strong, that Tarquin's native land is entitled to the honor. As to the claims of Egypt and of Greece, they may find adherents, amongst theorists; but practical minds know too well, that Rome has done more to cultivate the various properties of the arch, than all the world besides; and that, as there remains, to this day, the greatest specimen of its earliest construction, in that *cloaca maxima*, built by Etrurian hands, under a Roman king, who was himself an Etrurian, we may decide accordingly. But, whatever was its origin, its vast utility in building is unquestionable. The predominance, in Grecian construction, of straight lines, gave way to the arch, which led to the rapid expansion of design in Architecture, that found new forms, from the ideas of the various peoples, whose incursions into

Roman territory, gave fresh impetus to invention, by blending their conceptions with those they found in their plundering incursions. Thus the Romanesque, the Moorish, and the several forms of Gothic had their origin.

We will now proceed to describe those forms, and the mode of outlining them, by means of their respective centres; first premising, that the several stones of which an arch is composed are termed *voussoirs*, or *arch stones*, the uppermost one of which, as it serves to lock the arch together, as it were, is called the *keystone*. The lowest stone in each side is entitled the *springer*, as it is from these points the arch takes its rise.

The highest point in an arch is known as the *crown*, and is often called the *vertex*, this latter in pointed architecture only. The *springing* line is the lowest part of the arch, between which and the crown, or vertex, the solid space is termed the *haunch* or *flank*. The under, or concave, surface is denominated the *intrados*; the upper, or convex, the *extrados*.

The supports are called either *piers*, or *springing walls*; and likewise *abutments*, but this last term is more applied to the arch of a bridge or viaduct.

That part, at the springing line, on which the arch rests is known as the *impost*, and the *span* is the width of the two opposite imposts from each other.

The *rise* of an arch is the clear height of its intrados, above the line of springing.

A reference to the accompanying engraving will show the variations in form of the arch :

FIG. 1. An Ellipse or Elliptic Arch. This, with the *segment* and *semicircle*, might be set down as the only forms known to the ancients. It is struck from three centres, which are thus found : Divide the given line A B into four equal parts; taking together the two parts at the centre, as a base, form, on the under side, an equilateral triangle, whose three points will be the centres of the arcs respectively, which form the entire arch. By extending the sides D C, the limit of the springing arcs is fixed. Or, describe three circles, whose centres are the three points of division of the base line; and it will be seen, that the arcs of the two outer circles form the springings, whilst an arc turned from D, as a centre, with D C as a radius, will connect the springing arcs therewith. The point D is found by joining the intersecting points, until they meet at D.

FIG. 2. This is termed a *Stilted Arch*, in which the centre is above the line of the imposts, the full length of the radius of the arch, or, equal to one-half of the diameter. A B is the diameter. C D is the radius.

FIG. 3. The *Horse-shoe Arch*. Similar to the foregoing, except that the imposts incline inwards, which curvature is determined by taking the points A and B, at the extremities of the diameter A B, and, with the diameter for a radius, describing arcs, which will be the curved imposts required.

FIG. 4. An *Equilateral Arch*. Take A and B as centres, and with the diameter A B as a radius, describe the segments A D C and B D C, which will enclose an equilateral triangle A C B.

FIG. 5. The *Lancet Arch*. Divide the span from A to B into three parts. Extend the line of the span one part on

each side; and, taking each of these points D D as centres, with D E, respectively, as radii, describe the arcs A E C and B E C.

FIG. 6. Take the height of the impost, and measure it off on the base line. Do this on each side. Now, take C and D, respectively, as centres; and, with D E and C E, respectively, as radii, describe the arcs, as required. Otherwise, thus: Take half the span H E, as a radius; and describe the quadrant E F. Bisect this quadrant; and continue the line of bisection, until it cuts A B at D. Do the same at the opposite side; and it will give the point C. From each of these points C and D, with those bisecting lines as radii, describe the arcs.

FIG. 7. Is a *Trefoil Arch*. Divide the diameter A B into three parts. Take the points C and D, as centres; and turn the quadrants A E and B E. Join the upper points; and, from the centre of this junction line, draw a semicircle. Or, on the base line A B, divided as before, at C and D, erect a square; and proceed as before.

FIG. 8. Another *Trefoil*, more generally used than the foregoing. Divide A B into four equal parts; divide the height into two parts at C, and join the points C D and C D. Form the points C D D. With these points, turn an arc and a three-quarter circle.

FIG. 9. A *Drop Arch*. Divide the span A B into four parts; and, taking the points D D, at either side of the centre, with D A and D B as radii, describe the segments, which will bound an equilateral triangle.

FIG. 10. *Cinquefoil Arch*. Divide the span into five equal parts. From the extreme points A and B, with the span as radius, describe the semicircles A C and B C, respectively. Divide the segments A C and B C; and, from the points of division to the centres A and B, draw lines. Now, take A D and B D, respectively, and draw segments parallel to the outside ones. At the intersecting points of the division line, be-

fore spoken of, will be the centres, from which turn semicircles. Likewise, turn quadrants at the base, and a three-quarter foil at the apex.

FIG. 11. Is a *Semicircular Arch* showing the lines of the *voussoirs* A C C C, &c., which are radii of the semicircle. B is the *Keystone*.

FIG. 12. *Polyfoil Arch*. Divide the line of span into eight equal parts. From the points A and B, describe the segments A C and B C. Divide these into four parts each; and, from the points of division as centres, turn semicircles.

FIG. 13. The *Ogee Arch*. Divide the span A to B into three parts; and, from the points E and F, as centres, draw the semicircles A G F and B G E. Now, re-divide the line of space into four parts; and, taking three of them, erect

perpendiculars, A D and B C, at either end; and join the points D C. Bisect the angles A C D and B C D with the lines D H and C H; and, from the centres C and D, with the radii C H and D H, describe segments connecting the arcs A G and B G with them, thus forming the *Ogee Arch*.

FIG. 14. *Tudor Arch*. Divide the span-line A B into three parts, A E, E F, and F B. On the part E F construct a square, which will give the four points or centres. Draw the diagonals D E G and C F G. From the centre E describe the arc A G. From F, as a centre, describe B G. Now, taking C as a centre, and C H as a radius, continue the segment to the apex; then, taking D as a centre, and D H as a radius, describe the segment connecting the springing arc; and the *Tudor Arch* is complete.

DRAINAGE.

THE proper draining of streets, is a subject of great interest to the civil engineer who has charge of a city, and many are the instances of failure in this matter to be found in our country, young as it is.

When a village is first laid out, it is an easy and an economical work to form a system of main drainage conformable to the circumstances of the location; yet how seldom do we see forecast displayed in this line. Villages spring up, grow, and become cities, great cities, and it is just at this latter point that the grand error becomes painfully evident to an over-taxed community. The error is one so often repeated, notwithstanding, that the whole thing becomes almost mysterious. Is there no ambition in the founders or projectors of those embryo cities to lead them on to the contemplation of future advance of valuation, and to suggest to them the good policy of securing the

great lines of arterial draining, while yet the prices of land and materials, and the cost of labor are within the limits of positive economy.

We know of one large city in the West, that this subject applies to most intimately, where the location is such, that even surface draining has a natural facility of action, and yet the advantage has not been taken at first, and to-day the difficulties increase, while the city treasury pales before the giant adversary to be overcome.

Surface drainage, for streets with a quick descent is excessively disagreeable in rainy weather. Baltimore and Cincinnati, under the influence of the dreary god Pluvius, give a full elucidation of our ideas on this subject. In the former city, stepping-stones are built into the pavement, and rising high above it, to enable passengers to cross without being subjected to wet feet. In Cincinnati the rush of descending rain-

water is fearful, and some streets are perfectly inundated during, or immediately succeeding a rain-storm.

The drainage from houses should not be a superficial operation, crossing the sidewalks, but should be carried under them, and have a sufficient fall to the curbstones to prevent any lodgement of water and consequent freezing. These cross drains should have sufficient capacity, and be made smooth, to prevent the lodgement of any obstruction to the free passage of rain-water from the spout, with which it should be connected in the best manner.

But all that we have said relates to surface-draining only. We will now descend to the still more important work termed SEWERAGE, into which *drainage* may be said to merge itself.

In this age of *sub-cellars* descending, on an average, twenty feet below the surface of the street, it would be very desirable, indeed, to have the main sewer built low enough to receive the drainage of such cellars; and thus avoid that pumping which is so great an expense, in many cases, in our large cities.

We need not, of course, offer any counsel to the judicious experience of the engineer entrusted with the very serious commission of surveying and mapping the main sewer of a village or city, either already commenced, or in prospect. But, if he has the initiatory work to do, he must certainly possess a very great advantage over the professional brother who has to deal with streets already built, and is confined to levels which he must pursue.

The *egg-shape* is decidedly the best form for a sewer, for it has not alone the great advantage of strength, but that, also, of narrowing the invert, thereby contracting the lower part of the channel, and increasing the depth of flow, by which means the velocity and scour are much improved. Another advantage of this form, is the attainment of greater height with a given

area; and, in fine, the construction is more economical.

Various methods of constructing sewers approximate to this *egg-shape*. Some have been made with a semi-circular top, flat segment sides, and a sharp, segmental invert; the curves of those sides and invert, differing according to the varying proportions of height and width, and other circumstances. Others are constructed with six centres, the upper part being described with two radii, instead of being semicircular. The most to be preferred of all the modes and proportions is the following:

Let the height of the sewer be to the width as three to two; then, describe a semicircular crown; and with a radius equal to the width, or span, taking each of the springing points of the semicircular top for the respective centres, describe segments; for the invert, with a radius of either one-half or one-sixth of the whole height, describe a semicircle which will connect with the foregoing segments, and thus complete the construction.

It must be remarked of this egg-shaped sewer, that the form is inconvenient to walk up, when workmen have to examine it, or make repairs. A flat bottom would, unquestionably, be the most fitting for that purpose; and many scientific and practical men are of the opinion that the latter shape would be the best for perfect drainage. As much might be advanced in the way of argument on both sides, we propose to leave the question open.

Should it happen that the grade of a road or street might be so low as to prevent the height being such as we would advise, two, or even more, egg-shaped sewers might be laid to make up the aggregate area required.

The above sewers, if not more than four feet in height, and to be constructed in a good building strata, may be of half-brick work, on account of the intrinsic strength of their form. But, if built according to the other modes, can-

not be less than brick thick, unless, indeed, the required sewer happens to be very small.

They are constructed of common brick, of good hard quality, in lime mortar, with the exception of the invert, which is jointed with pure cement mortar.

Radiated bricks should be expressly manufactured for sewer building, as the joints of ordinary brick are necessarily too open at one end, and, consequently, make but a poor job at best.

The rate of inclination must be a subject of mature consideration. The greater the fall, the more intense the velocity, is the governing rule, and this, of course, includes the perfection of the scour. Give the greatest rate to the house-drains; the next rate to the pipes with which they are to be immediately connected; and so on, diminishing the rate gradually as you get towards the outlet. The reason for this is obvious; for, in the first place, your main object is to remove the sewerage from immediate proximity to the houses, so that perfect drainage is of less consequence at a distance than it is in the houses themselves. But, beyond this, there is another more important object in such arrangement, for as the body of water is less in the drains or sewers more remote from the outlet, it is more likely to be sluggish in its movements than where there is a large volume of water, and this tendency to sluggishness is overcome by an increased rate of inclination, so that the want of velocity caused by the small body of water in the lesser sewers is compensated by the extra fall, and thus the flow in all cases is rendered equal, or very nearly so.

Ventilation is a very necessary subject as applied to sewers; especially main sewers, through which, at times, men may have to pass. We would always recommend air shafts to be constructed at a good sharp inclination from the crown of the arch of the main sewer to the gutter at the sidewalk, and if this is done at the corners of streets,

these air-ducts, or ventilators, will also answer for street surface drains. This practice is now well understood, and, until some better one is devised, it is to be hoped that it will never be neglected.

Thus much, at present, on the subject of DRAINAGE; one of so much imminent consequence to the health of every community, that on its observance rests the responsibility which every conscientious man incurs, who undertakes so important a work.

FELL.—We have some poor building done on this side of the Atlantic occasionally, but we have not yet had the mortification of chronicling, in this advanced nineteenth century, anything like that which we find in the *London Builder*, namely, the fall of two houses at Liverpool, which were "topped out" at three stories high. The basement walls were *nine inches thick*! and from the ground-line to the top were but *four-and-a-half inches thick*! These walls, carrying the joists of the three floors, buckled up, like a sheet of paper, and fell. The wonder would have been great had they stood. Their fall was well deserved, and to be rejoiced at; were it not that, by it, four poor men were killed.

ANOTHER AID.—Joinery has gained much by mechanic invention. The planing-machine not alone relieved the workman of an immense amount of drudgery in the way of smoothing boards, but it likewise tongued and grooved them in the truest, as well as speediest manner. Scroll-sawing did great things for him; and now he has an aid more admirable still, in the *dove-tailing* machine, which at once rids him of a very harassing operation, difficult to perform in a truly workmanlike manner, and worthless if not done so. We are glad to see that this latter machine is so completely successful, doing its work as perfectly as any other Yankee notion.

STAINED GLASS.

FROM THE OLD AUTHORITIES.

No. 3.

THE MANIPULATION.

HAVING previously given The History and General Method, and The Materials, of Mediæval Stained Glass, from the Old Authorities, we now present The Manipulation of the Artists in Glass, of the days of yore. The reader, especially if technical, will, however, receive this matter, entirely, as reminiscential and suggestive. A present success often depends upon the knowledge of a former blunder; and an important invention, or discovery, may spring from a train of thought, or newly ascertained fact, either but little, or in no way, taken to it.

"When Newton saw an apple fall, he found
In that slight startle from his contemplation,
A mode of proving that the world turns round
In a most wondrous whirl, called gravitation."

It may be that a similar chance, in these extracts from older pages, will extend the powers of the assiduous and indefatigable artist in glass.

THE MANIPULATION.

When any one wishes to paint, let him choose Lorrain glass, which inclines to the *whitish yellow*, because that bears the fire the best, and receives the colors better than any other. When the subject which he is to paint is not large, the glass is to be put upon the drawing intended to be copied, the outlines of which are to be traced with a pen or hair pencil, and with the black color already spoken of. If this color is dry, it must be ground an hour, on the copper, with water; and a small quantity of gum Arabic, dried as before directed, is to be added to it. It must be expeditiously mixed; and if the quantity of color is equal in size to a nut, as much gum Arabic as is equivalent to a small nut, must also be put into it. The gum

must be dissolved before the color is used, which ought to be neither too clear nor too thick; and, when those outlines are marked, they must be suffered to dry for two days.

A wash is then to be applied to them, made of six or seven grains of gum Arabic, well dried, mixed with six or seven drops of urine, and as much black as necessary; so, however, as not to hinder the color from being very clear. To make it well, the black ought to be put into a little basin of lead, and be covered with the wash, in order that it may not dry so soon; and when the outlines have been left for two days to dry, this wash is to be passed equally and very lightly over the whole, in order that the outlines may not be effaced; after which the work is to be permitted to rest for two days more.

This wash serves for the first shadow, or demi-tint; and for the second tint, the color must be repassed, with the pencil, over the necessary places.

To produce the lights and heightenings, a pen, or the handle of the pencil, is to be used, as has been already mentioned; and as much of the first wash is to be removed, as shall be deemed necessary. This is the method for works in white and black, technically called *GRISAILLE*, from the general effect being *gray*.

As for the colors, when the black is applied, as above, and dried for two or three days, they are to be laid on in the following manner:

Enamel colors, such as blue, green, and purple, must be expeditiously laid on the piece of glass with the pencil, after having been well tempered with gum-water. The other colors must be

employed with caution, according to the work which is to be executed; and care must be taken not to efface the outlines; or the colors may be conveniently applied on the other side of the glass.

Yellow is, most frequently, made in the furnace; but, in using, it must always be laid on the back of the glass very even, more or less charged, according to desire, and never near blue; because, in being melted and re-heated in the fire, these two colors would only make one, which would be green. It is for this reason necessary, as has already been said, to lay on the yellow, on that side, where there are no other colors; for it sinks through the whole thickness of the glass. This other colors do not; for these last, having more body, do not penetrate so far, and some of them even remain on the surface.

When the colors are to be baked, and the glass put in the fire, after being painted, a small square furnace of brick is to be made, which each way should not be more than about eighteen (18) inches, that is to say, however, according to the quantity of work which has been prepared. At the lowest part, and six inches from the bottom, an opening is to be made, to put in and stir the fire. Above this opening, two or three square bars of iron are to be placed, which will cross the furnace, and divide it into two. Over these bars, and to the right of the door below, a small opening is to be left of about the thickness of two fingers in height and breadth, to let the trial-pieces pass through, while the work is baking.

The furnace thus prepared, an iron pan, of the form of the furnace, must be procured, of such a size as that, being laid on the bars of iron, it shall want about three full finger's breadth or more of touching the walls of the furnace; for which reason it ought to be square, and it should be of good earth, well baked. Its bottom should be about the breadth of two fingers in thickness, and its height, at its sides, about half a foot.

After this, a quantity of plaster, in powder, well sifted, and three times baked in a potter's furnace or a tile-kiln, must be provided, or rather of quick-lime well separated or sifted. Some persons use cinders well burnt, but they are not so well adapted for fitting the pieces intended to be baked.

The pan being placed on the bars, in the middle of the furnace, a portion of the plaster in powder, or of the lime, must be spread there, about half a finger's breadth in depth, as equally as possible, and, above, some pieces of old broken glass are to be placed, and then some powder, then some old glass, and then some powder, so that it may have three beds of plaster or lime, and two of old glass, which is called *stratum upon stratum*. On the third bed of plaster the pieces which have been painted should begin to be spread. They are to be laid in beds, so that there may be half a finger's breadth of powdered plaster, or lime, very evenly spread between each piece of glass; and the ranges in this order be placed one above another, continually, until the pan is full, if the number of pieces to be baked is sufficient to fill it. After this, the last bed is to be covered with some of the powder, and it must be remembered that the pan should have a hole in front, to answer to that of the furnace, above the door through which the fire is put, in order that the pieces of glass, with which the trials are made, passing straight from one to the other, may enter into the pan, and there bake the same as the rest.

All things thus disposed, some bars of iron are to be placed, which may rest on the walls of the furnace; and the pan is to be covered with a large tile, made on purpose, or with several others. They are to be ranged and luted as closely as possible, with some soft earth or mould, so there may be no aperture, except at the four corners of the furnace, where one ought to be left, of about two inches in diameter, in each corner.

The furnace, thus closed, is to be heated, with a few lighted coals, at the entrance of the door only, and not within. After having been in this state for an hour and a-half, or two hours, the fire must be pushed a little further forward, and then it is to be left for another full hour, at the end of which the fire is to be suffered to enter the pan by degrees. When it has been thus for about two hours, it must be increased by little and little, and at the end of two hours it is to be further augmented, by filling the furnace gradually with good charcoal from young wood, so that the flame may go out at the four holes of the four corners, and at that which ought also to be in the middle. This is called the chimney; and the fire ought to be very brisk and ardent for the space of three or four hours. During this time, and to the end, some of the proof or trial pieces, which are in the small apertures of the furnace and of the pan, should be drawn out, to see whether the colors are melted, and if the yellow is produced.

When the colors are almost produced, some very dry wood ought to be put into the furnace, but cut into small pieces, in order that they may go entirely in at that place. For, to do the work well, the door of the furnace ought to be shut during the whole of the baking, except at the beginning, and when the fire is yet at the entrance. The fire of wood, which is lighted towards the end, ought to cover the whole of the pan in which is the work, till it is perceived that the whole is baked, which usually happens after the fire has been in it for about ten or twelve hours, or eight or ten, if the hottest degree of fire has been given to it at first. But this is not so good a method, because by these means the whole is often lost, by burning the colors and breaking the pieces.

Caution must be used when the bars of iron become cherry-colored or spark-

ling, for that shows that the baking is advancing, and requires of the operator both attention and care.

Thus ends Felibien, upon this subject. His directions, now-a-days, doubtless, are antiquated, as his style; but they were good, for those times, as that, unquestionably, was good work-day prose. But there is another aspect to this question, and that is the romantic and the poetic.

Through no other medium, than stained-glass, can the reader obtain any thing like an adequate conception of the warmth and brilliancy of the imagination, which conceived the story known to almost every child, in the civilized world, as "Aladdin and the Wonderful Lamp," and to the adult reader of E. W. Lane's magnificent translation of "The Thousand and One Nights," as "Allah-ed-Deen."

We of America, simply staying at home, but faintly appreciate the suggestiveness of these large jeweled windows of the ages that were. Their rays have fallen upon the eyes of the poets and are reflected from their souls throughout the later literature.

Of all the bards, John Keats, in his "Eve of St. Agnes," best suits our instant need.

"A casement high and triple-arched there was,
All garlanded with carven imageries
Of fruits, and flowers, and bunches of knot grass;
And diamonded with panes of quaint device,
Innumerable, of stains and splendid dyes,
As are the tiger-moth's deep-damasked wings;
And, in the midst, 'mong thousand heraldries,
And twilight saints and dim enblazonings,
A shielded scutcheon blushed with blood of queens and kings.

"Full on this casement shone the wintry moon,
And threw warm gules on Madeline's fair breast,
As down she knelt, for Heaven's grace and boon;
Rose bloom fell on her hands, together pressed,
And on her silver cross soft amethyst,
And on her hair a glory, like a saint.
She seemed a splendid angel, newly dressed,
Save wings, for heaven:—Porphyro grew faint—
She knelt, so pure a thing, so free from mortal taint."

GAS WORKS FOR PUBLIC INSTITUTIONS.

By HENRY P. M. BIRKINBINE, Engineer.

WHEN an important town or city is to be supplied, there is no difference of opinion, in regard to the materials, from which to make illuminating gas. With scarcely an exception, bituminous coal is the substance used, for obvious reasons. It is procurable in such large quantities, in so many different localities, and can be transported so easily, that there is but little fluctuation in its price.

When, however, illuminating gas for a public institution, or a small town, is desired, it is customary to look for other materials, such as wood, rosin, refuse oil, fat, petroleum, refinery refuse, benzine, or gasoline, from which to generate it. Works to carbonize these materials can generally be constructed at less cost; and are supposed to be more easily managed, as requiring less skill and care in working them. Some of these materials are dangerous, and liable to explosion; others fluctuate greatly in price; from some of them it requires a great amount of skill, to produce gas of a uniformly good character; and some of the apparatus necessary requires frequent repairs, being liable to many accidents not common to coal gas works. Architects, in this country, generally specify, that gas, for the supply of public institutions shall be made from one of the above-mentioned materials, when the use of coal would probably be both cheaper and better. Specifications lately published for a large public institution, located one hundred and fifty miles inland, and within one hundred miles of bituminous coal fields, required works to generate gas from rosin. There must be some singular misapprehension amongst architects, or they would not thus recommend the adoption of works which are generally unreliable, and ex-

pensive in repairs, costing more for materials, and, as a consequence, producing gas dearer than that made from coal.

The following is a description of works, now in successful operation, for making gas from bituminous coal. They are designed to furnish from two thousand to five thousand cubic feet per day:

Building.—The entire works are enclosed in a building fifty-eight feet long, twenty-seven feet wide, and sixteen feet high to the square of the roof, divided, by a brick partition, into two apartments: A containing the retorts and washer, and B, the condenser, purifiers, meter, and holder.

Retorts.—The retorts, for generating the gas from bituminous coal, are placed at *a*, in room A. There are three retorts, contained in separate furnaces, each capable of producing twenty-five hundred cubic feet per day, without forcing. They are supplied with a hydraulic main, and connecting pipes, of suitable dimensions. The *Washer* is placed alongside the retorts, at *w*.

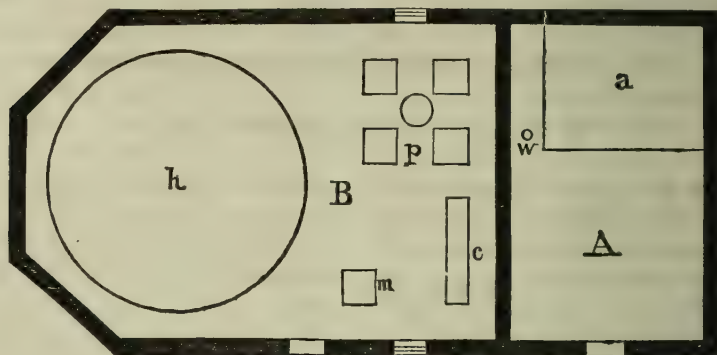
Condenser.—This is a series of four inch stand-pipes, with tar-box below; and is placed at *c*, in room B. The connections between the hydraulic main and condenser are six inches in diameter.

Purifiers.—These are four dry-lime purifiers, with centre-seal, placed at *p*.

The *Meter*, for measuring the gas manufactured, is at *m*.

The *Gas-holder*, shown at *h*, is twenty-two feet in diameter, and fourteen feet high, with a storage capacity of five thousand cubic feet. The tank, for the holder, is excavated; the bottom paved, and the sides walled up with brick, laid in hydraulic cement.

The *Connections* from the condenser to the purifiers, from the purifiers to the meter, and from the meter to the holder,



are all four inches in diameter; and are supplied with the necessary stops and drips, to insure the constant working of the apparatus and control the different parts.

Works of this capacity will cost about six thousand five hundred dollars, say:

For building and tank, . . \$3,000
Iron work complete, . . 3,500
————— \$6,500

The arrangement of these works is so simple, that any man of ordinary intelligence, can be instructed so as to take charge of them in a few days.

ESTIMATED COST OF MAKING GAS BY THESE WORKS.

1st. When an average of 2,000 feet per day is made:

Interest (\$6,500, at 8 per cent.) for one day, . . \$1 42
Coal, 470 lbs., plus 15 per cent. leakage, $\frac{540}{2000}$ tons, at \$5, 1 35
Labor, one man, 1 50
Repairs, wear, etc., at 15 cts. per 1,000 feet, . . 30
————— \$4 57
\$2.29 per thousand feet.

2d. When an average of 3,000 feet per day is made:

Interest (\$6,500, at 8 per cent.) for one day, . . \$1 42
Coal, 705 lbs., plus 12 per cent. for leakage, etc., $\frac{720}{2000}$ tons, at \$5, 1 93

Labor, one man, . . . \$1 50
Repairs, etc., at 12 cents per 1,000 feet, 36
————— \$5 26
\$1.75 per thousand feet.

3d. When an average of 4,000 feet per day is made:

Interest (\$6,500, at 8 per cent.) for one day, . . \$1 42
Coal, 940 lbs., plus 10 per cent. for leakage, etc., $\frac{1034}{2000}$ tons at \$5, 2 59
Labor, one man, 1 50
Repairs, wear, etc., at 11 cents per 1,000 feet, 44
————— \$5 95
Less 200 lbs. coke, at $\frac{1}{4}$ ct. . . 50
————— \$5 45
\$1.36 per thousand feet.

4th. When an average of 5,000 feet per day is made:

Interest (\$6,500, at 8 per cent.) for one day, . . \$1 42
Coal, 1175 lbs., plus 8 per cent., for leakage, etc., $\frac{1270}{2000}$ tons, at \$5, 3 18
Labor, one man, 1 50
Repairs, wear, etc., at 10 cents per 1,000 feet, 50
————— \$6 60
Less 400 lbs. coke, at $\frac{1}{4}$ ct. . . 1 00
————— \$5 60
\$1.12 per thousand feet.

In these estimates, no allowance is made for the cost of lime, and other incidentals; nor is there any credit for tar and waste lime, as they will probably equalize each other.

No credit is made for coke, except when an average of 4,000 feet per day is made; because, unless the works are making nearly their full capacity, little, if any, coke can be saved.

The estimates go no further than five thousand feet per day; as that is considered a fair working capacity; but the works may be able to furnish seven thousand five hundred feet per day, if necessary.

RECAPITULATION.

Cost per 1,000 feet—

When 2,000 feet per day is made,	\$2	29
“ 3,000 “ “ “	1	75
“ 4,000 “ “ “	1	36
“ 5,000 “ “ “	1	12

These figures will enable a comparison to be made of the cost of gas procured from coal, and that obtained from other materials.

ORIGIN OF “JOHN O’GROAT’S HOUSE.”

MANY of our American readers have heard of this celebrated point, on the coast of Scotland; but few know the story of its origin, which is as follows:

In the reign of James the IV of Scotland, three brothers, Malcolm, Gavin, and John de Groat, supposed to be originally from Holland, arrived in Caithness, with a letter from the king, recommending them to the countenance and protection of his loving subjects in the county of Caithness. These brothers bought some land near Dungess Bay-head; and, in a short time, by the increase of their families, eight different proprietors of the name of Groat possessed these lands in equal divisions. These eight families having lived peaceably and comfortably, for a number of years, established an annual meeting to celebrate the anniversary of their an-

cestors' arrival on the coast. In the course of the festivity on one of these occasions, a question arose respecting the right of taking the door, the head of the table, and such honors of precedence; each contending for the superiority and chieftainship, which increased to such a degree, as would probably have proved fatal in its consequences, had not John de Groat, who appears to have acquired great knowledge of mankind, interfered. He expatiated on the comfort they had hitherto enjoyed, owing to the harmony, which had existed between them; he assured them, that, as soon as they appeared to quarrel amongst themselves, their neighbors, who had till then treated them with respect, would fall upon and expel them the country; he therefore conjured them by the ties of blood and their mutual safety, to return quietly to their several houses, and pledged himself that he would satisfy them on all points of precedence, thus preventing the possibility of such disputes, in future, at their anniversary meetings. They all acquiesced, and departed in peace. In due time, John de Groat, to fill his agreement, built a room distant from all other houses, on an octagon plan, with eight doors, and placed a table of oak of the shape of the room in the middle. When the next meeting took place, he desired each of them to enter by his own door, and to sit at the head of the table. He himself occupied the last. By this ingenious contrivance, the harmony and good humor of the company were restored. The building was then named John O'Groat's House. Nothing now remains but the foundations of the building. The place still retains the name, and has long been a fixed locality on all maps of Scotland, as well as on mariner's charts.

It will thus be seen that Burns had ample warrant for his address—vide “Captain Grose”—

“Hail, Land o' Cakes, and brither Scots,
Frae Maiden Kirk to Johnny Groat's.”

THE VALUE OF MAN

BY GEORGE J. HENKELS.

POLITICAL economists have always adopted the precious metals, as a standard of value; and, so long as surrounding circumstances favor this rule, their theories seem correct; but the developments of the last twenty years have so unsettled the conditions of the whole world, that the old rules do not seem to be infallible. The annihilation of space, through the magnetic telegraph, and the rapid communication, by steam vessels and railroads, have revolutionized commerce and science; and what was formerly, by sound commercial judgment regarded as a promising profitable speculation, and which, although requiring a year to develop, is now reduced to an almost instantaneous certainty; and, instead of the merchant purchasing largely, of an article for export to a foreign country, without the knowledge of what price the article might command, when the vessel should arrive at its destination, he is enabled, by the use of the telegraph, to know, at any time, the foreign value of his goods, and instead of shipping cargoes to run the risk of rates, in most cases, he sells at a fixed price, not only before he ships, but before he buys for export. Thus the market values, in the principal marts of the world, are always to be obtained. The consequence is, that he, who was formerly known as a merchant, that is, a man who exchanged, by his own ships—freighted with cargoes, mostly belonging to himself—the commodities of his own country for those of another, is now known as a ship-owner, whose principal business is to carry goods for other owners, or as a commission merchant. The changes affecting importers have had corresponding influence on manufacturers and storekeepers. Formerly, a manufacturer in the country, or a

storekeeper in some remote place, was obliged to lay in, at certain seasons, the stock or materials required in his business, several months ahead of his positive immediate wants, as the distance to be traveled by stage, to purchase, and the length of time required to transport the goods, by canal and wagons, rendered the time of receipt uncertain. Now, by the use of the telegraph to send orders, and the quick despatch of freight by railroad and steamboat, he is enabled to supply his wants daily; and the trade of our large cities, which was formerly concentrated into two months, each season, is now distributed over the whole year. These changes, in the manner of doing business, have had their influence on the matter and method of productions of all kinds.

Now, proceeding to our subject proper, **THE VALUE OF MAN**, we will try to advance some new ideas, in vindication of the new theory that, instead of gold being the standard of value, the worth of man is the true standard.

When the writer was apprenticed to learn his business, the day's labor was considered, by all indoor mechanics, to be from seven in the morning until eight in the evening, in winter; and from sun to sun in summer. Some years ago, when mechanics obtained a concession, and ten hours was agreed upon as a day's work, the writer then opposed it, on principle, as it was but *agrarianism* in a modified form. At the present time, we have a national law, making eight hours a day's work in the Government employ. If eight hours' labor is to be recognized as a day's work, why not make it six hours, four hours, or even two hours, on the same principle? You will, no doubt, say, that this matter will correct itself, in time; but you

must bear in mind, that this has been the expectation ever since the ten-hour system was recognized; and, instead of correcting itself, it is daily growing worse and worse. All master mechanics will corroborate this fact: That, when wages were low, and work hours long, the workmen did twenty-five per cent more work in the hour than they do at present. There is an intelligent cause for this; and, if we discard old theories and search for truth, we shall discover it. Formerly, labor was plenty, and gold was scarce; now, comparatively, gold is plenty, and labor is scarce. Suppose a contract had been made with a workman, twenty years ago—when twelve hours was considered a day's labor—for a gold dollar a day, for thirty years, which, to-day, would be the measure of value, the gold or the labor? Or, suppose a contract was to be entered into, to-day, to build a house for \$20,000, in gold, during the year; and suppose, that all building mechanics should strike for eight hours per day, and be successful in obtaining it, would it not show that labor is the standard? That is, eight hours' labor would command as much gold, after a successful strike, as ten hours' labor would have commanded previously. Now, reduce the day's work of man, to a smaller number of hours; or, abolish labor altogether, and allow all men to subsist only on the spontaneous products of nature, or on such materials as each could individually produce—admitting that such a thing could possibly occur—what would then be the value of gold? No circulating medium would be required; and, consequently, gold would be of no use, except for ornaments, which would have to be worked to the size and fashion fancied by the wearer. But labor would be of value, because on it would depend the production of the means of individual subsistence. Again: Suppose, that a gold mountain should be discovered, where the beautiful metal could be had, in illimitable quantity, without more labor

than is required to produce iron, would not its intrinsic value fall below that of either of the baser metals, from the fact, that it is of but little use to mankind, except as a medium of exchange, and the means of ornament? It would be of no use to build engines, to make agricultural implements, or for any other mechanical purpose. If its scarcity is advanced as a reason that it should be the measure of value, why should it still maintain that position, in the face of the immensely increased production of gold compared with other precious metals? If some mineral, from its scarcity, is required by the world for a standard of value, why not select platina, or even one kind of precious stones; as the production of these does not increase in ratio, beyond the increase of the world's population, as gold has done, within the last twenty-five years, which increase, from present indications, is likely to become greater, every succeeding year. Suppose you engage a man at mining, on the side of a mountain; and employ another man at raising wheat, in the valley, alongside of the same mountain. Say, the miner can produce fifty dollars in gold, per day, for a season; and the farmer could only produce one bushel of wheat per day, worth two dollars; which would be the standard of value, the fifty dollars in gold, the two dollars' worth of wheat, or the labor of the man? The labor of the man is the standard, as he, by labor, produces the gold and the wheat; and, without his labor neither would have any tangible existence, so far as the human race is concerned. *The creature cannot be greater than the Creator.* Statistics are always dull reading; and are generally resorted to, by writers, to bolster up arguments. I will not refer to them, to show the relative increase of gold, in proportion to the increase of population, as it is a matter that all observant men are conversant with; but, by referring to the pages of the Bible, I will show, that, in the early ages of the

Christian Era, the labor of man was considered the standard of value. By turning to the twentieth chapter of Matthew, we find the parable of the Laborers in the Vineyard: where the master of the Vineyard agreed with the laborers, early in the morning, for *a penny a day*; and, at the third, sixth and eleventh hours, he agreed with others for the same hire, thus making the man's labor the standard of value. This parable also shows, that, at that time, a laborer could only command a penny—an inferior coin—a day. At this day, a laborer can command nearly two hundred of the same coins for the same amount of labor. Now, if the precious metals are the standard of value, why is it, that they will not purchase as much labor, now, as they did eighteen centuries ago? It is not because labor is more scarce, as the increase of population has always been in the same ratio. The fact is, you can purchase more gold, with a day's labor now, than formerly; and the relative difference in value, between labor and gold, is widening every day. The value of labor, all over the civilized world, has increased greatly within the past six years. Taking Italy, where labor is plentiful and cheap, as an illustration, we find that, in 1865, the stevedorage for loading marble was two and a-half francs per ton; and, in 1868, it was four francs, in gold, per ton. Other labor has advanced in proportion, throughout Europe; and, in our own country, we find, that the commercial value of gold has no influence on the value of labor, particularly on that of skilled labor.

If I am right, in my opinions—and the signs of the times seem to verify them—the value of man will still increase; and the prices of all raw materials—even if we return to specie payments—will not depreciate, to any extent. Houses will cost more to build; machinery and ships will cost more to construct; and everything that requires skilled labor will increase in value. The

workingmen begin to know their value; and persistent demands for increased wages, and fewer hours to a day's work, will neutralize any advantages, that may be gained, in time, by inventions in labor-saving machinery. Those who look forward to specie payments, as the panacea, that is to cure all the ills of the body politic, and reduce the price of house-rent and living, are deceiving themselves, as workingmen, even at the present wages, cannot support a family; and they, too, are looking forward to specie payments to enable them—not to reduce their wages, but—to indulge in some of the good things of life; and, possessing the power, as they do, they will see that their wants shall be attended to. In all future operations, the value of man must be considered as paramount, and to it all other values must be subservient.

The time has passed, never to return, when fifty thousand dollars in gold was considered a sufficient fortune for a man to retire on; and, for the future, those with limited incomes must cut their garments to suit their quantity of cloth. A revolution in the applicability of time-honored maxims is progressing; and it seems, from the tendency of things, that all men, instead of "*bringing their wants within their means*," must, in the future, "*bring their means up to their wants*." The workingmen, throughout the world, are organizing, not only for their own protection, but for the purpose of compelling capitalists to yield to their demands. Whether those demands will seem just or unjust, to those who will be compelled to submit, is not the question. *The workingmen possess the power of numbers*; and, knowing from the past, that they were almost starving, on low wages, in 1858—when good mechanics could be had for six dollars per week—they will take care, that such a state of affairs will not occur again. It does not require a prophet to foretell, what is coming, as he who runs may read, that the great efforts, now being

made, in the name of liberty, throughout the Christian world, to elevate the working-classes, is fast educating the masses in the belief, that capital is antagonistic to labor; and that labor must organize *politically* for defence, or aggression, as the circumstances may arise. The whole tendency of events is towards *agrarianism* in its most obnoxious shape. The prudent mariner

prepares his vessel for the coming storm; and those who manage the various ships of state must exercise the greatest care and judgment to provide against the coming conflict. The "*VALUE OF MAN*" will be the great question, for political economists to solve, as the labor of the world *intends to determine* and regulate the value of gold, as compared with the sweat of the laborer's brow.

PENN SQUARE FOR THE MUNICIPAL BUILDINGS.

By H. M. B.

PENN SQUARE is the only spot for the New Court Houses, the Municipal Offices, and the City Hall; and these will be there erected, if the will of the people is obeyed.

It seems almost incredible, that, in this nineteenth century, the age of intelligence, improvement, and progress, we find so many men with dwarfed and narrow intellects sitting in high places, a clog to advancement, an incubus to the grand and rapid march onward of a city, destined soon to eclipse the most populous on this continent.

It requires a liberal and extended view, a broad and expansive comprehension of the wants of a people, to decide upon the erection of municipal improvements, intended, not for the present merely, but for the use of centuries to come. A man must be able to discern, through the dim vista of the future, the magnitude of the requirements of posterity. Instead of comparing what has been sufficient, with what is now required, he must compare the present requirements with a calculation based on fifty years hence [as it were foolish for any one to do otherwise] and then project a building to be super-adequate at that time. At the present ratio of increase, in this city, it requires no mean order of intellect, to arrange a plan for such a building. It is necessary, even

in that view of the case, to have ample grounds adjacent for additional improvements.

There are men, in this community, whose minds can first conceive such a building, then plan it, and finally make, of wood and stone, a practical realization of their ideal. And should we, who boast so much of our beautiful city, its magnificence, and wealth, build in an inferior order of architecture? Shall we sacrifice to *parsimony* an opportunity offered us to build an edifice that may out-rival Michael Angelo's grandest dream of magnificence? Heaven forbid! Let us wake up the slumbering genius of our architects, and, in this century, erect a building that will shame the antiquities of Greece and Rome, that will exceed the vastness of the past, and transmit to posterity the glory of the age in which we live immortalized in our works.

And where can we erect such a building? The ground must be spacious; and the view must be unobstructed. It must be at the junction of some great spacious thoroughfares, giving to the beholder an extended view. No place is so appropriate, as Penn Square, at the junction of two of the widest streets in the city: Market street extending from the Delaware to the Schuylkill, the great centre of traffic, and the main art-

ery, throbbing with the fiscal life of this great city; and Broad street, extending from League Island to Hunting Park, a distance of twelve miles, one of the finest avenues in the world, destined to be improved with splendid buildings, and to control our social life. These squares are nearer the centre of business, as it will be ten years hence, than can readily be imagined.

To the observing mind, it is a well-demonstrated fact, that all business is moving westward, as our city increases. Year by year, new stores are demanded, and they must, of necessity, be provided west of Broad street. Chestnut street improvements have crept gradually westward, until, during this year, one of the most extensive dry goods firms in this city has erected a splendid marble store west of Broad street. Colonnade Row has given way. Its old frowning front has broken and fallen back from the irresistible charge of modern improvement. The newspapers are moving west: in one stride, they have stepped from Third street to Seventh street.

The buildings on Independence Square will be needed for some other city purposes. Let us revere the time-honored square, hallowed by the events that clustered round the birth of liberty in America, and made sacred by the men whose memories are immortal. Let us commit no sacrilege; but preserve its precincts with jealous care, and hand it down to posterity, with all its traditional and historical glories undimmed. Generations to come will condemn any act of vandalism committed by us, upon a country's treasure. It is not ours to desecrate. But it should be preserved inviolate, as a national estate. Practically, the ground is not large enough for our wants. The streets are too contracted. We want room. We must have expanse. We are too large now to contract. Let us scatter to the winds all selfish issues; and, for the good of future generations, unite our wisdom.

When the Continental Hotel was built, many judicious people thought it too far west. If it had been built on Broad street, the projectors would have shown their wisdom. Bailey & Company's jewelry store, at Twelfth street, in twenty years from now, will be thought too far east; and they will sell out to some printing house, and move their colony west. West Philadelphia is destined to become a large and populous part of the city. Its rapid advancement at the present time, indicates surely its destiny in twenty years.

Penn Square is centrally located. It was a great geographical centre, as laid out by William Penn, and called Centre Square. It is now the greatest commercial and railroad centre in the city. The streets upon which it is situated are the finest in the city, giving ample room, light, and ventilation. I can conceive of no serious objection, that can be urged in opposition to it. Indeed, none but very short-sighted, or directly-interested people, can declaim against it.

It is said by some that it would ruin property-holders, in the vicinity of Independence Square, to remove the public buildings from Sixth and Chestnut streets. I do not see the force of this reasoning. The eastern part of the city, now occupied by lawyers' offices, would be in great demand for coal, insurance, and other offices. The buildings would not be finished for ten years. During that time these things will find their level; and men, whose business compels them to be in close proximity to the public buildings, can gradually change. It cannot possibly affect the newspaper offices. They always were east of the city buildings. It is only lately they left Third street for Sixth and Seventh streets. They must have scented the carrion from afar; as now they will be east of the Penn Square buildings, as they always have been of the old buildings, until very lately—and near enough for business. The tavern-keepers, etc., like camp-followers,

will always be where the plunder is. Around the patriotic shades of Independence Hall will cluster an immense mercantile interest. The retail trade will be pushed farther west; and what many men now deprecate as disaster, would crown our fair city with profit and glory. Instead of decreasing the value of property about Sixth and Chestnut streets, it would increase it, through the demand of and for commercial houses. The heavy wholesale business would be done between Sixth street and the river. The space is small enough for the future business of the city. The Penn Square buildings would increase the value of their surroundings, raise the assessments upon the surrounding property, and largely increase the revenues of its owners as well as those of the city.

The greatest interests of this city are its investments in manufacturing and real estate. It is the revenues derived from these that sustain our metropolis, and will pay for the new buildings. Now, the erection of these buildings at Penn Square will be more central, for these interests, than at any other point. There has been no sound argument urged by any against this location. All the clamor, that has been raised is a blindly self-interested one; for, if the parties making this opposition, would pause for a moment and reflect, looking calmly into the future, they could not fail to apprehend the immense benefit, that, not only the city, but they themselves would derive by the increased values of real estate.

Now I might enumerate many more and weightier reasons why our buildings should be upon Penn Square. The most important is the ample room there. No able architect can say that Independence Square is large enough. There is not in it space sufficient to erect a grand and massive structure, suitable to the wants of generations to come. The Pennsylvania Central Railroad, with their mammoth improvements on the Schuylkill, concentrating the business of

a whole country, tends largely to make this location central. We are building three thousand houses per annum, besides many factories, stores, &c. In twenty years, at the same ratio of increase, with that of the last five years, we shall have built over sixty thousand houses, and who can define the limits of business then? All these houses will be built north and south of Market street, and west of Broad street. Shall we, either to answer our own selfish ends, or, to satisfy our narrow and contracted vision, fail to grasp the immensity of this undertaking, fall short of our duty, and give the people a hovel for Lilliputians, when we might have erected a temple for Giants?

These four squares seem to have been laid out expressly for this purpose. If William Penn could have foreseen the gigantic strides his infant city would ultimately take, he could have made no wiser provision for its future convenience. Shall we, then, throw away this valuable gift, and erect narrow and contracted buildings upon a comparatively small lot, when we have these spacious squares? The opportunity we now have of combining utility with grandeur is too important for us to pass over lightly. Let us consolidate these four squares into one, with an avenue, as wide as Broad street, surrounding them; and erect a building, in the centre, massive, grand, and towering. Let our ambition be to excel all other cities in this improvement. A noble structure, with a dome rivaling Saint Peter's, gathering, under its shadows, the wings of an edifice, unequaled for its convenience, beautiful in its proportions, and magnificent in its architecture—the ornament and pride of our city, the wonder of all beholders, and the greatest achievement of the age.

IN LONDON, all the judges, without exception, are said to be in favor of the new Thames Embankment for the site of the new building for the Law Courts.

CLASSIC TASTE.

DR. AIKIN, in his Essay on the Application of Natural History to Poetry, truly says: "Genius, which is the power of invention, ransacks every region of nature, science and art, for material, on which she may exercise her powers. The beauties of poetry cannot be completely relished, without a habit of attending to those forms of nature, from which the poet borrows his conceptions; and observing with accuracy, the distinct features and peculiar characters of objects in the vegetable and animal world; nor can the excellencies of a classic building be truly estimated but by those who have had a classic education."

This is all true, to a certain extent; but, on what is its truth founded? That, in the studying of those delightful emanations of the Grecian, or the Roman mind, when at its acmé of perfection, we but *pirate* the works of those who devoted lives of endless energy and enterprise to discoveries and inventions in art.

The earliest architects were the best professors, and are now the most correct masters we can model after. Their successors may have beautified, what they had already blocked out; but, certain it is, that they originated the primitive forms of beauty in architecture, to be codified, and dressed in varied detail, in after ages. Those early masters, who thus laid the foundation of a world of art, were, themselves, but modest students, who drew their lessons from Nature's Book; and, by close application to the laws which govern her teachings, could not fail to transmit to the world broad ideas of design, so suggestive of beautiful images and forms, that it is no wonder, why those who followed them became so enamored of the task, and so assiduously studied out the precepts laid before them, adding fresh thoughts to illustrate those of the earlier days.

Thus, every mind, in every age, threw an additional light, upon the first simple art-lessons of Nature's architects; until the whole became illuminated, and so dazzling to the vision of the enrapt student, that he dared not advance a step beyond them, knowing only that

—— "Fools rush in
Where angels fear to tread!"

Such, then, is Classic Art; and to estimate it rightly, Dr. Aikin truly says, requires a classic education. But is not GENIUS as bright to-day, as in those primitive times? And are not Nature's works as plenteous and as inexhaustible? Why, then, may not our students, instead of borrowing the reflected light, all brilliant though it be, seek the great source itself; and illuminate their minds with its direct influence?

Alas! it is a pitiable pilgrimage, this of modern architecture. Ever seeking, without deviation, those time-tinted shrines of art our progenitors have left us, until their presence, in our works, becomes a necessity overshadowed by impenetrable superstition.

CLASSIC TASTE—What is it? A labored study of the lessons, which others have taken the pains to prepare for us; and, through such teachings, to receive those mental impressions, collectively denominated Taste—Classic Taste.

Why will not our students in architecture ransack every region of nature, science, and art, for materials to exercise their minds upon? Why is not Natural History a study absolutely requisite to an appreciation of the beauties of their favorite mistress?

Where can they look for more exhaustive lessons, than are to be found in the teachings of botany?

Has chemistry no claim upon the mind that seeks to make concrete cements, conglomerates, and amalgamated metals, subservient to his constructions?

In fine, does the ambitious aspirant

to art-fame desire to do justice to the genius with which he is gifted?

If so, let him re-search the Book of Nature, which they of the *classics* searched so well; and he will find, that there is an abundant harvest of information, to be gleaned from its pages yet, which cannot fail to inculcate a taste—a *classic taste*.

So, remember that, it is not in the mere study of the ancient relics of art we should look for ideas; but in the yet fresh and invigorating fields, whence the inception of those beauteous relics came. The nearer the spring the purer the draught. All our young friends should bear this in mind; and also, that the genius of invention in architecture, is not dead and buried with the past, but lives, and will live, for ever. It is for the ambitious student, who comes to his work with a lover's ardor, to strive and make fresh loveliness appear. Determination like this is what will give character to modern architecture and inculcate, in something more than the mere name, a *CLASSIC TASTE*.

MONTHLY MEMORANDA.

PROSPECTIVE—There will be more building this season, in the United States, than has ever been known in any one period before. There is no safer or better investment for spare capital, and there is no greater national blessing can be conferred by wealth, than in the construction and embellishment of cities, which cannot fail of exciting the admiration of foreigners, and that pride of our citizens, which is a certain impulse to progressive exertion that knows no impediment, and seeks for no final point. *Esto perpetua.* Go ahead!

GLAZED COLUMNS.—It has been suggested to use in all public buildings, lay and ecclesiastic, instead of solid stone, or cumbrous wood columns, in the aisles of churches or halls, light iron pillars, and to surround them with plate-glass,

stained in various colors. Very beautiful effects might thus be produced, and a happy riddance be insured of the existing system of blank obstacles intended to support the roof, yet insupportable to the convenience and comfort of the people.

ARCHITECTURESQUE.—Professor Kerr, of London, has suggested the use of this new coined expression, as a parallel to that other art one, picturesque, and there is much ado about nothing, in consequence, among the British Architects. If the word is an apt one, why not use it? If it be worthless it will never get into use; and that's all about it.

STONE-DRESSING MACHINERY.—Some three months ago the stone-cutters of Bradford, England, struck because employers began to use machine-dressed stone. The employers turned the tables on them, and insisted that their workmen should in future dress all the stone. Now, most of the building-stone used there is *hard*, and the stone-cutters soon found that it would not pay to work it, so they struck again, but in favor of *machine dressing* this time.

THE CITIES OF THE DEAD.—The excavations at Herculaneum, which for the last twenty years have been interrupted, will be shortly renewed, the King having given from his private purse the sum of 30,000fr. for that purpose. Pompeii was buried but a few metres, but Herculaneum is covered with lava, scoria and earth to a depth of from twenty-one to thirty-four metres.

RELIGIOUS LIBERTY—The municipality of Madrid has sold a plot of land in one of the promenades of the capital as a site for the erection of a Protestant church. The sale was concluded on the 3d instant, and the works are to be commenced before the opening of the Cortes. The municipality and the members for Madrid have been specially invited to be present at the ceremony.

CORRESPONDENCE.

It must be distinctly understood that we do not hold ourselves accountable for the opinions of correspondents.

MR. EDITOR: I read each month the pages of your admirable REVIEW with a pleasure which makes me hope that you may go on for many years to come, increasing in patronage, and sustaining the interest of the subject you have chosen.

In an article on "Our Street Architecture," you hinted at the convenience of an upper sidewalk, for the use of ladies and children. Now, it strikes me that would indeed be an admirable arrangement in our very crowded thoroughfares, especially here in New York. But I fear the enormous value of property, especially on Broadway, where it might be most desirable, would stand as a stubborn obstacle in the way. Yet, if the proposition were fairly examined, it would be seen that the loss of front on the second floor, for say ten feet deep, would be more than compensated for by the fact that it would throw open a second tier of stores for fancy and light goods, which could not fail of at-

tracting the ladies; and would, therefore, greatly enhance the value of property now comparatively unproductive on that story. And I would be inclined to suggest, that a continuous awning sheltering this upper sidewalk, or gallery, made uniform throughout, would add considerably to the advantages which such a construction would confer on the thoroughfares of our great city; and, in fact, every other city where business and pleasure jostle each other, to the inconvenience of each, all the day long.

What an improvement it would be to our streets to widen them thus, say even twenty feet; and what an enlivening effect it would have on the sombre upper stories to see an elegant open balustrade running the whole length of a street, enclosing a perfect parterre of blooming beauty and fashion. Trusting this subject may not be allowed to die of inanition, I subscribe myself,

NEW YORK.

PUBLICATIONS RECEIVED.

NEW BOOK ON ARCHITECTURE.—We hail with much pleasure the advent of a fresh effort to disseminate knowledge on the great and popular science of Building, entitled **PRINCIPLES AND PRACTICE OF ARCHITECTURE.** By Sanford E. Loring and W. L. B. Jeaney, Architects, of Chicago. Such a work, just now, is a most desirable auxiliary in the great effort to advance the knowledge, and consequent patronage, of our profession; and it will give us very great satisfaction to review the work when it comes to us.

HEARTH AND HOME.—We look upon every fresh appearance of such publications as this, with a feeling of pride, as well as of satisfaction. Pride for the increasing cultivation of our day, and satisfaction in the beauty and solidity of those aids to instruction which emanate from the press in steady progress, weekly. We have now a number of really useful, as well as interesting periodicals, whose columns are filled with talent, and are presided over by editorial ability of a high order.

The *Hearth and Home* is eminently one of these, and to say that Mrs. HARRIET BEECHER STOWE and HORACE GREELEY are contributors, is to speak assuredly of its success.

THE SCIENTIFIC AMERICAN.—We receive with pleasure the weekly visits of this admirable monitor of the workman. The engravings which illustrate its able articles are not to be excelled, and the labors of its editors and contributors are at once clear and decided. Many of its bold antagonisms to some brilliant theory or vision of the day, have marked its independence, when the popular voice and the whole public press were loudly adverse to its well founded reasonings. But time proved the truth of the position it had taken; and we have yet to see the first error of its decisions.

THE CHEMICAL NEWS.—This is a reproduction of a valuable London journal, with American additions. It is full of subject-matter most desirable to the chemist, the druggist, and the general reader.

THE TRADE JOURNAL.—Always up to the wants of the times, and ever popular, this publication is one of our fixed institutions.

THE RURAL GENTLEMAN.—Each number brings an additional claim to the attention of all who love Horticulture, Agriculture, and Rural Economy.

THE
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MONTHLY REVIEW.

ARCHITECTURE AND REPUBLICANISM.

IN countries where monarchy rules, or has ruled, it is at once perceptible that Architecture there has basked in the golden affluence of pride and ambition. The royal residence is not more profuse of its display of vanity, than is the proud temple, ostensibly raised to religion, yet too evidently dedicated to the glory of the prince whose liberality of a people's wealth piles up an enduring monument to stand as a record of his greatness for ages.

Every branch of government, civic or military, from the palace down, has its share of Architectural display; and next, the nobility take the position which rank has given them, and sustain by outlay, the grandeur of the governmental fabric they borrow their greatness from. Hence we find in such countries the mightiest, if not the choicest, treasures of design.

It is not so in our land of republicanism, where the people rule themselves; where the magistrate of State holds his high authority but for a season, and then falls back into the ranks of the people who chose him for the position he has held.

Our City Halls are our only palaces, and these are not residences like Mayoralty Houses in Europe; but simply official buildings for municipal purposes.

The State Capitol is in the same category, but of a higher class. It is the parliament house of the State. And the United States Capitol is the National representative building of the entire country, in which the delegated powers of legislation congregate for the government of the whole people.

First, then, amongst the Architectural monuments of our nation, is, as it should be, the CAPITOL at Washington. The State Capitols stand forth as the leading designs in their several States. That is, they should be such; and that they will be, appears certain, from the liberal efforts which are being made by many legislatures to erect structures worthy of a great and enlightened Republic of which they each go to make the whole.

There are many of these State Capitols that are worthy of admiration, and we doubt not but they will be excelled by those yet to arise. There is professional talent enough in the country to ensure so desirable an end.

The next in grade of civic architectural representation, come the City Halls, the Court-houses, Post-offices and Custom-houses. And these make up the features of this class of municipal sights to be seen by strangers who visit our shores.

Our Churches, unpatronized by government influence, are for the most part constructed more for religion than display, and do not venture on vast cathedral efforts, yet are nevertheless worthy of their high calling, and fitting testimonials of a people's homage to the KING OF ALL.

Kindred to these, come our places of education; where the greatest gift the ALMIGHTY DONOR gave to man, in the form of *mind*, is developed, and trained to repay in grateful usefulness the priceless benefit bestowed.

What we have spoken of may be classed as public architecture. Our domestic is likewise essentially republican; for, not being trammelled with a hereditary right of proprietary, we build but to please ourselves, and leaving our constructions to a succeeding generation, new ideas and fresh tastes are certain to obliterate, if not our memory, at least our habitations, and erect something more congenial to the spirit of its age.

Thus it is, that our dwellings, though possessed of all that our wants demand, and something more, are not erected on that scale, or with that solidity which is prevalent in the aristocratic mansions of Europe; where retainers of attachés, servants, and followers are to be housed, and the courtly pride of ancestry retained as long as royalty itself shall sway the land.

Here then is a field for domestic architecture, ever varying its features with its generation; which may in part make amends for the want of those mighty incentives of princely patronage which Europe holds forth in her public constructions, both ecclesiastic and laic. When, therefore, the general government or that of a State, resolves on building a new institution, of the limited number we require, it is a subject of very great interest to the people at large, and worthy of the most liberal effort; for the citizens of a State cannot but feel a peculiar interest in their

Capitol building; and moreover, it is the leading feature, and stands parallel with the legislative palaces of kingdoms.

NEW YORK, finding her pride of other days, the State Capitol at Albany, fast fading in its architectural eminence, and now altogether inadequate to her growth of grandeur, has commenced a work which shall be worthy of her empire of wealth and taste.

ILLINOIS, the young giant of the West, fired with a worthy ambition, has begun her work of raising a Capitol that shall be a source of pride to her, until the rapidity of her onward course may, at no distant day, demand a nobler legislative palace still.

IOWA has likewise turned her thoughts to Architecture, and determines on taking her place amongst its liberal patrons.

Other States will follow; the younger from necessity, the older in compliance with the promptings of a becoming pride, which urges them to do their part in fittingly illustrating the National taste.

Our Domestic Architecture may claim as its truest representatives those first-class streets in all our cities where what is denominated "upper tendom" delights to dwell: and, although they do not show such breadth of front as the European palaces of the nobility, yet they often display more taste and, allowing for the disparity of size, frequently, more dignity.

The hotels of our cities and even our villages are objects of interest, for their vast proportions; but their façades too often lack the *architecturesque*. There are some exceptions it is true, but the main object of the companies who erect them being convenience, comfort, and internal embellishment, there is a necessarily economic arrangement of external design. And all such desirable features as breaks in fronts, variety of roofs, &c., are studiously avoided, and in their place are continuous lines of

uniform wall, pierced with countless windows, in rows of undeviating regularity.

THE STORE FRONTS are a bright relief to the dull sameness just spoken of as applying to Street Architecture; and this class of design takes the full scope of liberty which its independence of strict rules permits it. In fact, "fancy free" appears to be the motto of designs for Store fronts. It is seldom we can, strictly speaking, rank them anywhere in Architecture proper. But in Design they surely hold a place, and there

is no questioning their importance, as an aid to Street Architecture.

To review the whole subject, at a glance, we must conclude that Republicanism begets its own Architecture, so to speak; and the observer will find throughout our new and self-governed nation, an appropriate freshness of thought in our institutions which everywhere influences their architectural representatives, and causes the two to assimilate as naturally as though the gray shades of ages hung round their union for a thousand years.

MINSTERS OF ENGLAND.

IN closing our review of the grand old Cathedral Church of York, we alluded to the rival claims of another, and not less beautiful ecclesiastic structure. We now turn to it with a feeling of pleasure, which those who have at some time trodden its sacred aisles will feel with us in renewing memories of

LINCOLN CATHEDRAL.

The foundations of this venerable work of holy beauty were laid in the city from which it takes its name, about the year 1086. Remigius, a Norman prelate, highly favored by William the Conqueror, was the first bishop of Lincoln, at that time one of the richest and most popular cities in England; and he having purchased land on the hill where the higher part of the town stood, a situation of commanding eminence, proceeded in the erection of his church with such speedy effect that it was prepared for consecration in the year 1092, or six years after, at which time he died, in great reputation for his piety, charity, and able conduct. Robert Bloet, chancellor to King William Rufus, was the next bishop. He consecrated the new cathedral, and carried on its building; the usual course in the erection

of such extensive fabrics, which necessarily took many years to accomplish, being to complete the choir and eastern parts first, so that divine worship might be performed, and afterwards to carry on the nave, with the addition of towers, and less essential parts, with such expedition as their resources allowed; the life of the founder very seldom permitting him to see his whole design accomplished. A fire which occurred in 1124, destroyed, or at least greatly damaged, the new cathedral of Lincoln; but this mischief was magnificently repaired by Bishop Alexander, who vaulted the roof with stone, for the prevention of a like accident in future.

The liberality of succeeding bishops, as well as of the deans and other dignitaries, aided by the people of this extensive diocese, gradually superseded the labors of the first builders, by erections of a loftier and lighter style, so that very little of the various buildings, which compose the magnificent temple now standing, can be attributed to Remigius, Bloet, or Alexander. The central part of the west front may be the work of Remigius, the masonry being composed of short square blocks of stone, roughly jointed with coarse mortar, full of small

pebbles and gravel, similar to the work of other buildings known to have been erected about the same time. The lower part of the two towers which rise from this front are also of Norman architecture, but the workmanship is more ornamented, and of neater execution; as is also that of the three portals, which show most elaborate specimens of semi-circular Norman arches. These are commonly ascribed to Bishop Alexander, who sat on the Episcopal throne till the year 1147. But, to whomsoever belong the credits of its many excellencies, there is one thing certain, that Lincoln Cathedral is intrinsically beautiful, and well worthy of all the admiration that can be lavished on it. True, it is not an archiepiscopal church like the Cathedral of York; yet, as a design of singular beauty in many of its parts, we cannot but look upon it, at least, with equal favor.

The name, LINCOLN, is derived from that given by the Romans, *Lindum Colonia*, to the city where it stands, and simply implies the "colony, or village, of Lindom." By a very easy contraction of each word this became Lincoln.

The city occupies the side of a hill the top of which is crowned by the beautiful Cathedral, majestic in itself, yet rendered still more so by its commanding position. It can be seen from a great distance, and presents to the eye a most imposing appearance.

The length of Lincoln Cathedral is about four hundred and eighty feet, and the width of the nave is eighty feet. Its plan is that of a double cross: that is, it has two transepts; one two hundred and twenty feet, the other one hundred and seventy feet in length. It has three towers; the great, or central tower, being two hundred and forty feet high. The two western towers are each one hundred and eighty feet high. Formerly the latter had spires which made them one hundred feet higher—that is, two hundred and eighty feet. These spires were constructed of wood

and were covered with lead. They were slender and graceful, giving a very elegant finish to that part of the composition. In a mistaken effort at improvement, in the year 1807, they were taken down. In one of the west towers formerly hung the bell so widely known as *Great Tom of Lincoln*. It was cast in 1610, and was broken up and re-cast in 1834, together with six other bells. It was from all these combined that the present bell was cast which hangs now in the central tower. This great bell weighs five tons and eight hundred-weight, and is six feet ten inches and a half, or, nearly seven feet, in diameter at the mouth. The Cathedral is almost all in the style called *Early English*, and was built in the eleventh and twelfth centuries. There are, however, some very curious Norman details to be seen in some parts especially. In examining the south tower and gable, we find a series of small pointed arches, just above the roof, noticeable not only for their being very early examples of that form of arch, but also as affording a proof of its having originated in the intersections of semicircular arches. There are two arcades of these, one above the other; the one being of regular pointed arches; and the other, as we have said, being pointed by reason of their intersection, although Norman in themselves. The proportions and details of both agree exactly. The lower portion of the north tower is composed of Norman Architecture. The lofty superstructures of these towers were added in the fifteenth century.

The western front, as finished by the Norman prelates, not satisfying the magnificent ideas of their successors, very large additions were made to it in the early part of the thirteenth century, and the whole was decorated in the highest style of embellishment peculiar to the earliest order of Pointed Architecture. The foliage is relieved with a most masterly hand, the mouldings are scooped into deep hollows, marking

the lines in strong shadows; and the statues are executed with great spirit and effect, particularly the two upper ones.

The noble eastern front, having the advantage of a spacious area before it, is seen to great advantage. It is in very perfect preservation, owing to the extreme hardness of the stone, and its color is unsullied by smoke. The principal window was probably one of the first of so great a size ever executed in England, none at least now exist of such dimensions and of equally early date.

The nave of Lincoln Cathedral was rebuilt about the same time as the Cathedral of Salisbury, and a great correspondence of style may be traced in them. The principal dimensions are also nearly alike, the chief difference being in the greater width of Lincoln in the centre, which makes the aisles narrower than those of Salisbury, the total breadth being about the same. The parapet and tabernacles for statues on the outside of the nave were added about a century after its erection.

The *Chapter-House* is a large structure planned in the form of a decagon, to the western side of which is joined a *nave*, that forms the entrance. The centre is supported by a clustered column, from which spring numerous ribs diverging through the vaulted roof.

This edifice exhibits a style of architecture uncommonly perfect for the era of its erection, which is said to have been the year 1200. Giraldus Cambrensis, the historian, is the authority given, and as he studied for the priesthood and took holy orders there, it is natural to suppose him to be a competent voucher. St. Hugh, the then bishop, was a native of Burgundy, and it seems by no means improbable that he might procure artists or designs from his own country; but this can only be the subject of conjecture.

The *Central Tower* is a wonderful work: standing as it does on four columns, the boldness displayed in

elevating such a vast structure upon such apparently incompetent support is truly astonishing; but an attentive examination of the building itself is necessary for understanding completely the manner in which this has been effected. Great care has been taken to make the walls as light as possible, by hollowing every part with galleries and passages; so that the tower may be said to have double walls, an inner and an outer shell. The angles of the upper story are crossed diagonally by arches, to form a base for the timber spire, which was originally built upon this tower.

The *Nave* is supported by seven principal arches on each side, which range from the central tower to the bases of the western towers. The other compartment, forming the eastern part of the church, comprises five arches in length, extending from the upper transept to the end of the building. This portion of the church displays a very different style to that of the nave and choir; much richer in details and lighted by windows of considerable breadth, filled with mullions and tracery. It was erected in the latter part of the thirteenth century, and was not entirely finished in 1306.

The plan of Lincoln, as we have already said, has a double cross-aisle, or transept, one in the centre of its length and a lesser one more towards the east end; the south end of the greater transept shows Architecture of rather earlier date than that of the nave, but the end appears to have been taken down and rebuilt about the middle of the fourteenth century. The circular window is part of this latter work, exhibiting a similar style of tracery to the great western windows of York and Durham Cathedrals. It is filled with ancient stained glass of exquisite colors, though a mere tissue of fragments, except in a very few compartments which have escaped the injuries of time and barbarian hands. The arch which encloses

this beautiful window is composed of open tracery of uncommon and striking character. The Central tower exceeds in height any tower in Britain, rising up three hundred feet from the middle of a church, and not having a spire, added to which the boldness of its situation giving a great advantage of elevation, a prospect of unrivalled extent is visible around it. The elevation of this tower was the work of two periods. The lower portion being coeval with the nave; the upper being undertaken in the reign of Edward the Second, at an early part of the fourteenth century. An exceedingly tall spire of timber, sheeted with lead, completed this sublime composition; but this spire was destroyed by a violent storm in the year 1547, and has never been rebuilt. The pierced screen, or parapet, which connects the pinnacles on each side, was a modern work, designed by Mr. James Essex, Architect, about ninety years ago. Its effect is extremely light and beautiful, although something discordant appears, upon a critical examination of its parts.

That beautiful portion of the church which extends eastward from the upper transept, is frequently called the *Presbytery*, the choir and surrounding aisles being anciently appropriated to the priests and clergy who celebrated public worship. The south porch, being the usual entrance for the bishop, was designed in a style of extreme richness, and the workmanship fully equalled the design: but the barbarous hands of fanaticism have demolished the central statue, decapitated the others, and broken away many of the ornaments. The figures over the doors represented Jesus Christ sitting in judgment, surrounded by angels, with the dead arising from their tombs, and the jaws of hell open beneath his feet. The arched roof has been exquisitely wrought in perforated wreaths of foliage, intermixed with small statues, several of which remain perfect, whilst others have been broken

and defaced. These sculptures show traces of colors and gilding, the decay of which is not to be regretted. Time has spread a warm mellow tone over the whole, and long may it remain untouched by any presumptuous attempt to restore or beautify it.

Among the monuments are those to Bishop Cantelupe and Dean Welbourne, of Edward the Third's time, a chapel to the memory of Eleanor, queen of Edward the First, and another with the Burgersh tombs. There is an ancient *brass* of Lady Swinford, the mother of the Beauforts, by John of Gaunt. It contained a rich gold and silver shrine of great value, removed at the Reformation by Henry the Eighth's vicegerent Cromwell, whose reforms were so ill received that the people rose in rebellion under Mackerel, or "Captain Cobler," Prior.

The *Library* contains a very early charter; such as the Norman kings were used to grant, to please their Saxon subjects.

The *Deanery* and *Vicar's College* are of the thirteenth century. An old Episcopal Palace was ruined in the civil war; parts of the great hall of which are still standing.

The *Exchequer Gate* is one of three or four old gates worth notice, especially the *Newport* (or North) gate, which is of Roman execution. This gate was erected one thousand eight hundred and twenty-nine years ago.

The City of Lincoln, over which the Minster just spoken of presides like a venerable patriarch of centuries, at one time possessed so many churches and religious houses that the fact gave rise to the proverb—"He looks like the devil over Lincoln," because it was supposed to be the object of his peculiar envy. Many of those edifices may be still recognized by the remains of Gothic windows and doors. Of the fifty churches fifteen remain, mostly of little consequence. Some of them offer to the observer specimens of Norman and Early

English work. But, apart from the overshadowing grandeur of its Cathedral, Lincoln has one great claim upon the curious in its being the residence of John of Gaunt, Duke of Lancaster, on the accession of whose son, Henry the Fourth, to the throne of England, his possessions, including the Castle on the hill opposite to the Cathedral, was merged in the crown, and now remains a part of the Duchy of Lancaster, the control of which of late days was in the hands of the illustrious Duke of Wel-

ington, and after him was in the care of the late Prince Consort of England.

How little did that singular man who founded this Duchy of Lancaster, ever dream of the changes his property would undergo, when he penned the following codicil to his will:

"I, John of Gaunt,
 "Do will and do grant
 "To Johany Burgoyne,
 "And heirs male of his loin,
 "All Dutton and Putton,
 "Till the world is rotten."

BIRTH OF THE ITALIAN STYLE.

AT the period, when the Italian Architecture, which we now so much admire, first made its appearance in the world, the manners and customs of that since so highly refined people who produced it, were very rude. For instance, a man and his wife ate off of the same plate; there were only forks; no knives, nor more than one or two drinking-cups in a house; candles of wax or tallow were unknown; a servant held a torch during supper; the clothes of men were leather jerkins, unlined; the common people ate meat but three times a week, and kept their cold meat for supper; wine was seldom drank; a small stock of corn seemed riches; the dress of women was very simple; the pride of the men was in horses and arms; the ambition of the nobles was to have great castles, or houses, with lofty towers.

It was in the thirteenth century, that the darkness, which enveloped Rome and her provinces, began to pass away, and the arts and sciences once more dawned upon the world. Italian genius now put forth its claim to recognition. Sculpture first, and Architecture next, through Bramante, and under the patronage of Pope Julius II., continued to progress; and in the sixteenth century, during the pontificate of Leo X., flour-

ished those great masters Michael Angelo, Vignolo, Palladio, Scammozzi, and Serlio, whose palaces and villas are, and will long continue to be, the admiration of connoisseurs and men of taste. To the unremitted assiduity of these distinguished artists, in the study of the Roman edifices, and to their invaluable publications, the world has been chiefly indebted, for the elucidation of the principles of ancient art, particularly to Palladio, who was born in 1518, and died in 1580. He has the exclusive glory of having collected, from the writings and ancient edifices, all that vast accumulation of symmetry and proportion, we recognize to-day, and reducing Roman architecture, under all its forms, to a regular and complete system. There are in all the edifices, erected under the direction, or according to the plans of Palladio, a noble simplicity, beauty, symmetry and majesty, that abundantly compensate for petty defects, and furnish all the ends of architecture, by producing greatness of manner, and elegance of design.

It was in the fifteenth century, that those public buildings and ducal palaces, which still remain at Milan, Mantua and Venice, in Urbino, Rimini, Pesaro and Ferrara, were erected, besides those of Florence and Rome, where magnificence contended with elegance.

DESCRIPTIONS.

ARCHITECTURAL LIBRARIES.

THERE is no want more felt by the student in Architecture, than that of scarcity of the books most necessary to his education in his profession. The cost of those standard works, to the possession of which his prospect lies through a long vista of successful labors alone, is an insuperable barrier to his present attainment of them; and yet his progress depends, in a great degree, on those, as aids to his advancement.

Few architects have complete libraries; many have but meagrely supplied bookcases; and none of those can be expected to give up, to the constant use of students, or draughtsmen, the costly works they cherish. In this country, the books and plates, so much needed, are almost unknown, to those who want them most. In this state of things, the weekly or monthly publications, which now emanate from the press, are most desirable assistants, friends, and guides; but, they do not, and they cannot, fill the deficiency, which is occasioned by the want of the necessarily portly tomes, containing the coveted information of authorities now far beyond their reach.

Our best public libraries afford a very scanty means of assistance to the student or general reader; and hence the too general ignorance, of even otherwise well-read persons, on the subject of Architecture. The apology, to be offered for this want, is a practical one, namely:—the costliness of books, so seldom enquired for.

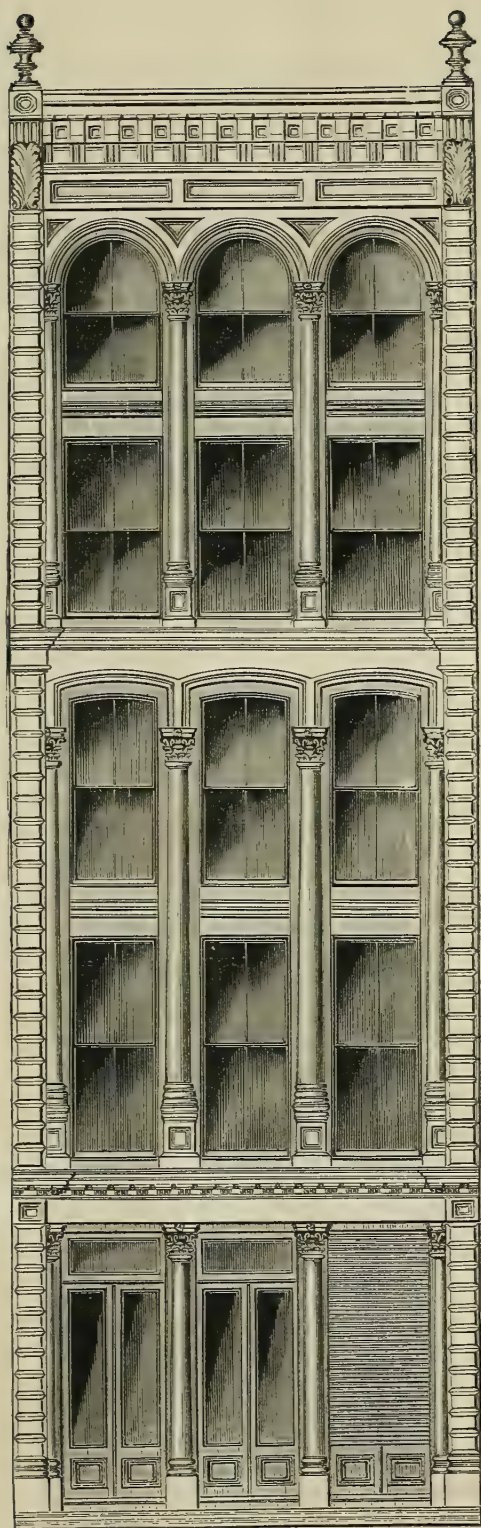
To meet this want of a place of mental resort for our professional students, as well as for general inquirers after architectural knowledge, *THE AMERICAN INSTITUTE OF ARCHITECTS* is now laboring zealously to establish, in New York, a Public Library, devoted to the wants

of students and draughtsmen. This is a most desirable institution, and worthy of every support: the evidence of the want of it is so clear, that its claims on public patronage are strong indeed; and the effort of the Institute is deserving of all credit.

No doubt, the European Architectural Societies will be in warm sympathy with this effort, to advance the best interests of the noble art, in this country, by affording its aspirants the requisite fountain of knowledge, whereat to drink. And there should be little question, that our own National Government will lend its aid to establish so great a work.

Individual possessors of valuable books and engravings, on the subject of Architecture, would confer a favor on the community by taking them from the oblivion of their shelves; and making them over to this library, or some similar one in Philadelphia, that the mission, for which they were originally meant, by their authors, that of doing the largest possible amount of good, should be literally fulfilled. In this way, we would soon find *ARCHITECTURAL LIBRARIES* established and prospering, for the most laudable of purposes—the propagation of a knowledge, now so limited, as to leave it a simple subject of surprise, that our designs are even so good as they are.

The Institute's pioneer advance on this branch of the great march of intellect, will soon be followed, in all our cities, by co-operative efforts, until every opportunity is given the struggling students, throughout the land, to store their minds with the much needed knowledge, which valuable publications give. Architectural Lectures will soon follow the establishment of the Public Library. Collegiate courses of instruction will come next; and the well-earned *diploma*



STORE FRONT. No. II.

will give, to the future architect, a proud testimonial of the sound knowledge he has acquired; whilst the nation generally will endorse the value of a perfect system of educated taste, which cannot fail to raise the standard of AMERICAN ARCHITECTURE to an eminence we must all, as patriots, feel a pride in its attaining.

But first, let the great initiatory step by the INSTITUTE be cordially sustained, in the establishment of the ARCHITECTURAL LIBRARY, at New York. Let there be no local feelings, on the part of the profession. The beginning is worthy of undivided attention; and, that point once secured, the local libraries will follow. Every architect, that has a spark of the true fire of professional pride in him, will trample private feelings, or local aspirations, to lend a helping hand to the national work, of which New York thus lays the foundation.

THE AMERICAN INSTITUTE OF ARCHITECTS asks for subscriptions to its endowment fund; and has founded two grades of honorary membership, the one "For Life" and the other "In Perpetuity," to be conferred on subscribers—to the amounts of One Hundred, and of Five Hundred Dollars, respectively. THE ARCHITECTURAL LIBRARY will be free to all students and draughtsmen. Doubtless every effort will be made to render it a valuable acquisition to the educational institutions of our country, and, in due course of time, a worthy compeer of those of London and other European cities.

Again we call on our professional brethren, and indeed on all friends of Art, throughout the entire country, to help on the enterprise, to the attainment of full and assured success.

IRON FRONTS.

No. 2.

THE design which illustrates the subject of Iron Fronts this month, by Mr. W. J. FRYER, of New York, is one in which mere ornamentation is not so

much the object of the composition as clearness of effect, and solidity of character. That iron has much in its favor as an appliance to Architecture no one can doubt. But, few will fail to perceive that in the very facility which it offers the designer to wander into the regions of forgetfulness, and down the steep of absurdity, or to produce compositions worthy of art, lies the great danger of its use in Design as connected with Building. The difficulty of STONE CUTTING is a safeguard against any very flighty efforts of ornamentation; compelling the architect to study his subject well, and forcing his erratic thoughts to keep within desirable restraint. This fear of libertinism in design applies no less to iron than to wood, and is a necessary consequence of the facility of manipulation in both cases.

We have frequently seen as great monstrosities as could be put forth by the wildest imagination forcing the attention of the observer in many a city of our country, carved out in wood, or run out in metal, with a recklessness that would be positively alarming in any community where sanity is esteemed a blessing and the want of it a curse.

If our great architectural iron works throughout the land, would positively refuse to execute any designs that must of necessity bring art into disgrace, they would not alone do a service to the whole community, benefit themselves eventually, but they would confer a lasting favor upon the great art they claim to illustrate. To do this they must either have within themselves the necessary qualification to enable them to form a decided judgment, or they must apply where they can obtain it. But, to employ uneducated draughtsmen to get up designs wherewith to stultify our street architecture, and drive sense and order out of sight, is to ensure the unpopularity of the very work they are too blindly urgent to promote. Of course, we would not be understood as finding fault with all those gentlemen

employed at architectural design in the offices of iron works. No, we are aware that there is much talent and information to be found amongst them. But, nevertheless, there have been frightful enormities put up in iron in various cities we are acquainted with; things that no conscientious architect would like to rise in judgment against him.

The public in general are supposed to possess no taste, and on this presumption gross incongruities in design are too often put upon the credulity of those who build. Here is the great mistake. The public eye is a sharp one, and demands to be pleased. Whether there be an educated or a natural taste, there is at least *an opinion* to be gratified; and

in such cases the majority rules, for though all do not think alike, a vast number may come to one conclusion, and *that* is, generally, sure to be correct.

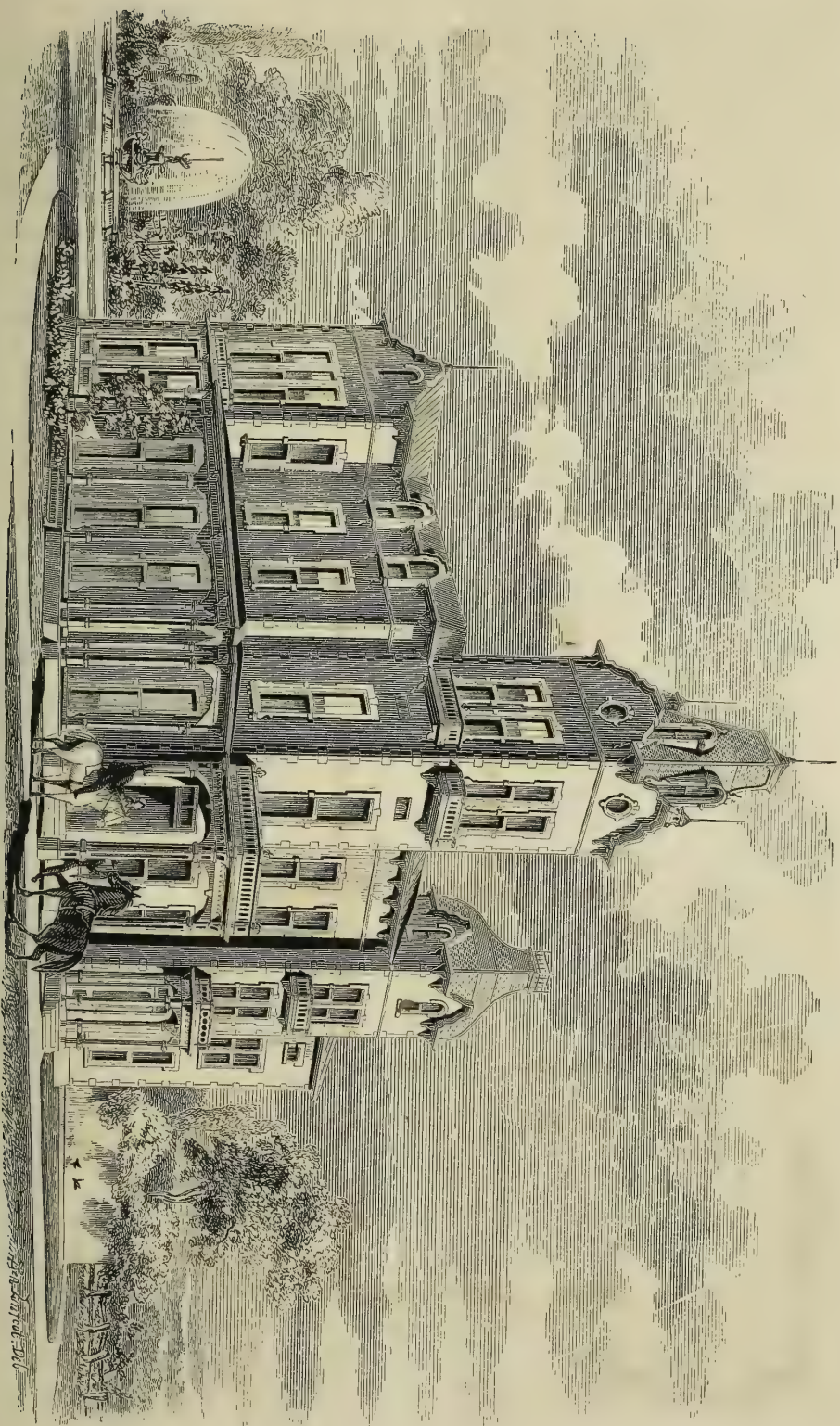
Now, to seek to deserve the public favor, be sure your effort is based on a sound foundation, and that it is backed by the principles of Architecture, which have endured so long, and will remain forever; simply, because they are endorsed by true taste and common sense, both of which the public have and understand.

A FRANCO GOTHIC VILLA.

THE accompanying illustration presents one of those peculiar styles of Domestic Architecture not immediately belonging to any strict rule of



VILLA FRANCO GOTHIC.



order, yet agreeable to some locations, either urban or sub-urban. And here it may be remarked that what is recognized as the French style, is singularly well adapted to a judicious blending of the Tudor. Hence the designation which we venture to give this composition, not considering it altogether in good taste to apply the English cognomen (Tudor) to a French construction. The term *Gothic* being more general and not so objectionable to national pride as that of "Tudor," which the British Architects have thought fit to apply to this peculiar treatment of Gothic. Nor is it very doubtful that the designers of those days, of the Tudor race of princes, borrowed ready hints from the domestic architecture of their neighbors the French, and, working them up into a composition of their own, produced this Tudor style. We do not think the unprejudiced eye can fail to find a similarity of features in the Chateaux of France, and the villa residences and "seats" of the Tudor style of England in the same century. The plan, as here shown, gives the following accommodation.

A, Vestibule. B, Parlor. C, Drawing-Room. D, Dining-Room. E, Passage. F, Hall and Principal Staircase. G, Kitchen. H, Servants' Hall. I, Private Entrance and Stairs. K K, Pantries. L, Porte Cochere.

RHODE ISLAND HOSPITAL.

THIS noble institution is indebted for its erection to the public spirit of the late Moses Brown Ives, Esq., who in the closing years of his valuable life bequeathed to his trustees the sum of fifty thousand dollars, to be devoted to such objects of public beneficence as they should select. Ten thousand dollars of this liberal bequest were expended for other charities, and the residue devoted to the realization of a fondly cherished

project, namely, the foundation of the present benevolent structure.

In the composition of the plan of Rhode Island Hospital, what is known as the "Pavilion system" has been perfectly carried out. Each pavilion or wing contains two complete wards, and the centre, which is the administrative building, is sufficiently ample to provide all the accommodation for the pavilions already built, as well as for as many more as may at any time be added.

The wings or pavilions consisting, as we have said, of two wards, placed one above the other, have beneath them a basement story twelve to fourteen feet high. Each ward is eighty-six feet long by twenty-nine wide, and fifteen feet high. Twenty-four beds are placed in each ward. Every patient has one hundred and four square feet of room and a breathing space of fifteen hundred and fifty cubic feet.

In addition to this large ward-room there are three smaller rooms, each capable of accommodating two patients, with an equally ample allowance of air-space and floor-room to those of the wards.

Thus thirty patients are provided for on each floor. This system of making separate provision for certain patients whose presence in a ward might not be acceptable to all, is a peculiar feature in the Rhode Island Hospital, as it is carried to a greater extent than in any other similar institution yet erected in our country.

Each of the wards runs north and south, and therefore secures the influence of the morning and evening sun. It is lighted by twelve windows, twelve by four feet, and filled with double sashes, each rising by weights and pulleys, and reaching from within three feet of the floor to five inches of the ceiling. The sashes are about two inches apart, and in summer time can be arranged in such a manner as to play an important part in ventilation, without exposing the patients to drafts of air. They are

closed inside by light blinds of black walnut, arranged in several folds.

The walls are of brick, enclosing an air-space to protect the interior from the influences of sudden changes of temperature, and are of great thickness. Within the inner wall a series of tubes about one foot square is constructed; one for each bed. These are lined with a cement as hard and as polished as marble. Three openings about ten inches square, are made from the interior of the ward into each of the ventilating tubes; one at the floor, beneath the bed of the patient, the second about three feet above the patient's head as he lies in bed, and the third at the ceiling. Each of these apertures is controlled by registers. The lower one is large enough to contain a night-vessel, and a tube may be carried from the night chair, when in use, to the lower aperture, and by this means all effluvium into the ward is avoided.

The walls throughout the whole hospital are covered by the same admirable cement as that which lines the ventilating tubes. This cement is composed wholly of lime and sand without a particle of plaster or sulphate of lime. It is expensive and difficult of application, requiring two or three times the amount of labor necessary for the mixture of lime, plaster and marble dust, commonly called *hard finish*. The expense of this cement is, however, more than compensated by its remarkable adaptation to hospital purposes. It will absorb no vapors or effluvia, and can be washed without injury as readily as a piece of marble. It cannot be scratched by the nail, and scarcely with a pen-knife, and it grows harder with age.

The floor is of beech and birch wood, waxed, laid in strips about two inches wide. The doors, and all other wood work, in and about the ward, are of the hard woods of the country, finished in the same manner. In fact there is not a particle of paint inside of the building.

At the end of the pavilion a fine stone

staircase, six feet wide, gives access to the wards from the lower floor. The steps are of a close blue stone, which does not wear smooth, and they are of such solidity that scarcely any noise or reverberation occurs, no matter how many may be ascending the stairs at a time. The well-room of this main stairway is about seven feet square, amply sufficient to contain a lift for patients when required. At the other end of the pavilion there is a smaller staircase also of stone, and equally fire-proof, giving access to each story, useful for the service of the ward, and providing a way of escape in the very improbable contingency of a fire cutting off the main stairs.

The nurses' room is a handsome apartment just outside the ward and near the head of the main stairway.

It has a window opening into the ward, commanding a full view of every part of it. It also contains ample closets for holding the necessary linen and bedding and apparatus of the ward; opposite to it is a large drying closet, heated by steam, in which mattresses can be baked and linen thoroughly dried and aired before use. Next to this is a small kitchen, provided with a range and gas, very ample for all the usual wants of the wards in making infusions and keeping warm the food of very sick patients, and in case of need, capacious enough to do all the cooking that would be required if the ward were filled with patients; so that in case of necessity, the ward could be wholly isolated from the rest of the hospital, and filled with patients suffering from contagious disease, without any risk to those in the other parts of the building.

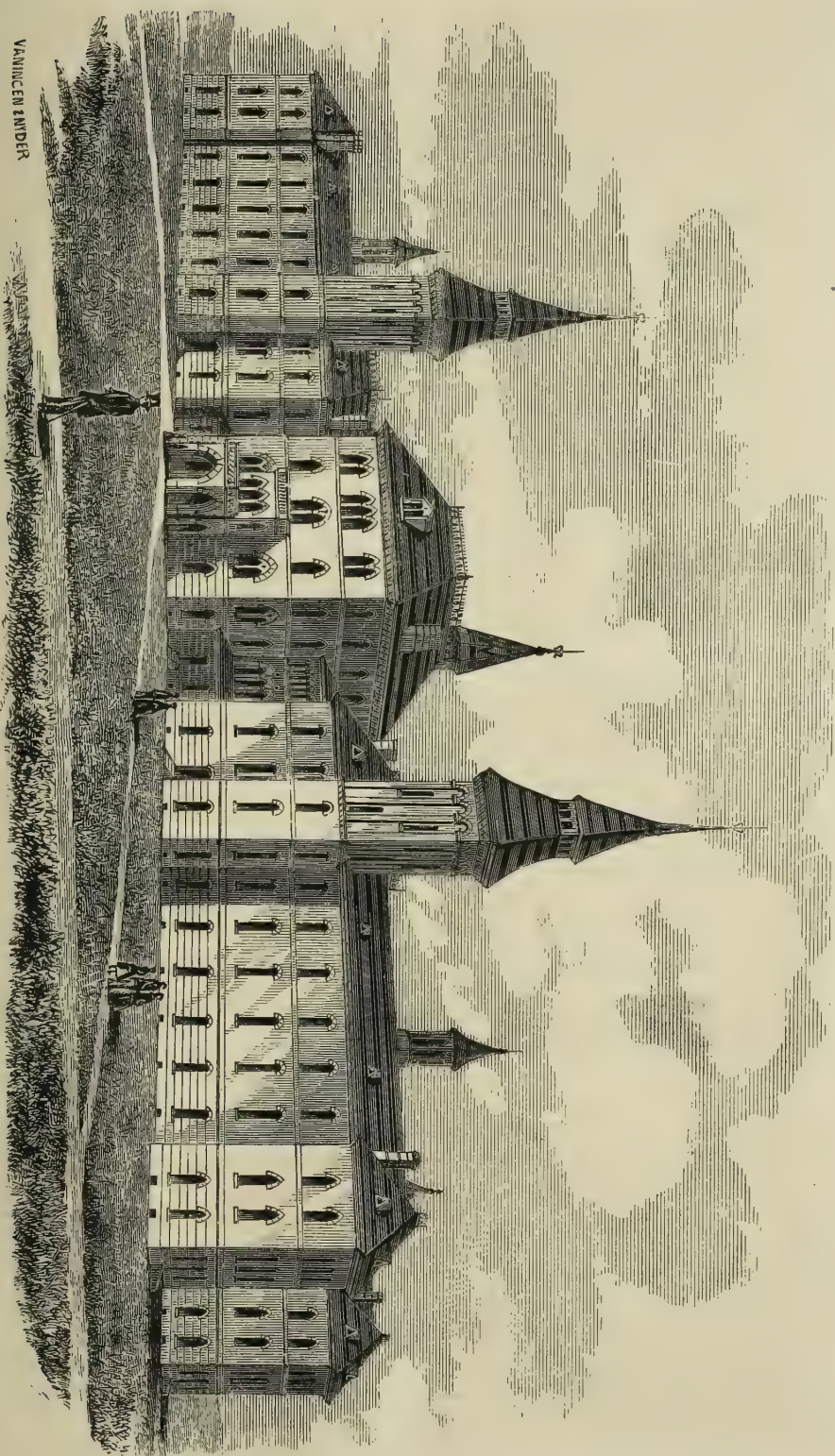
Adjoining this kitchen is a dining room for convalescent patients; a luxury that exists only in some of the latest and very best hospitals.

At each end of the ward are water-closets and urinals; four at one end, two at the other.

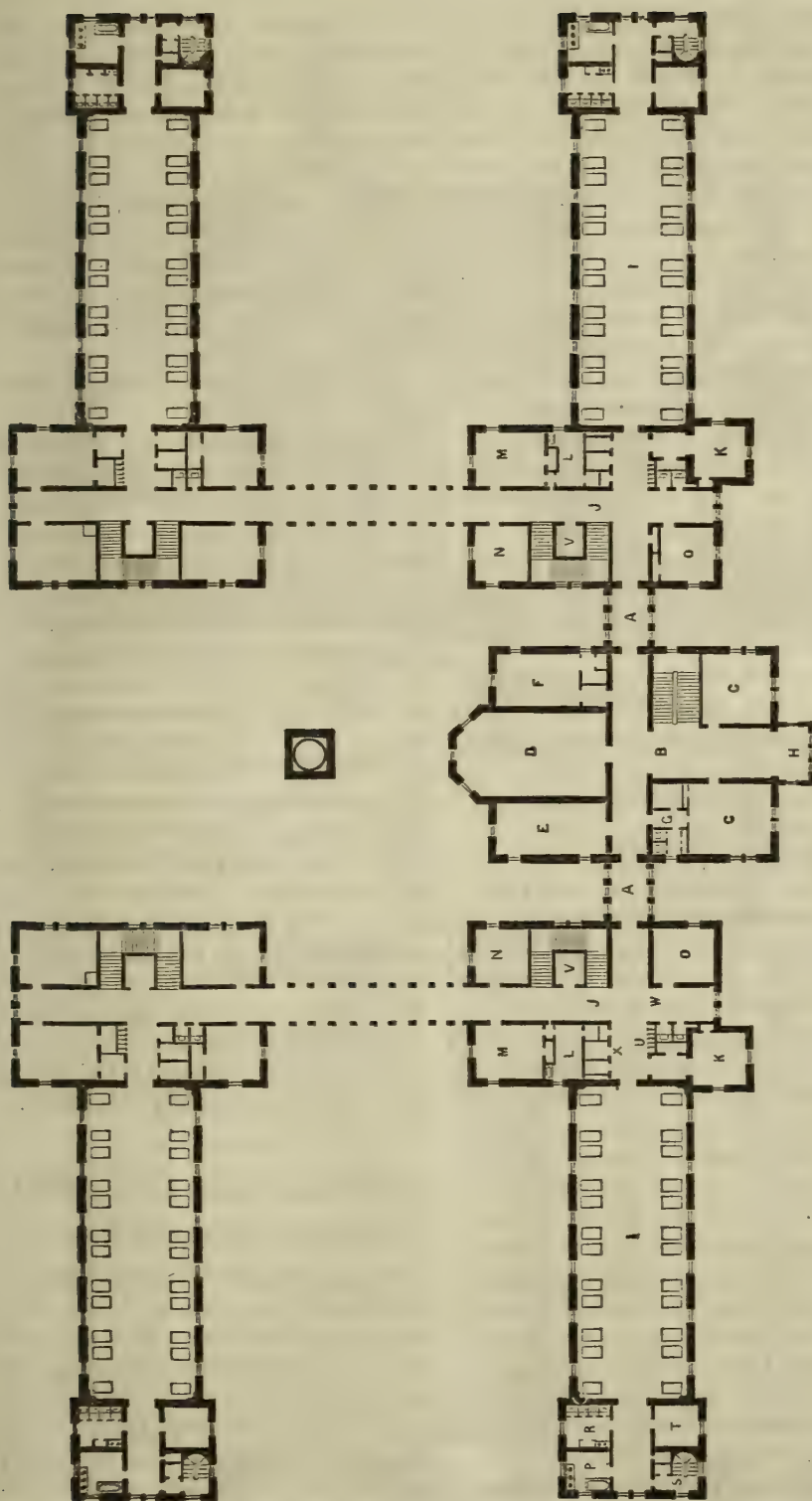
All pipes, of every description, which

VANINCEN & NIDDER

RHODE ISLAND HOSPITAL, PROVIDENCE.







PLAN OF RHODE ISLAND HOSPITAL.

lead to the sewers are trapped in the cellar, and above each trap a pipe of suitable size is carried to the main chimney flue. The consequence is that there is not a foul pipe in the whole establishment, which has not at all times a current of air *downwards* through it, sweeping all deleterious smells and gases into the tall external chimney, where they are decomposed and delivered high into the atmosphere, above every portion of the building.

A commodious bath room, with tub and lavatories, is provided at one end of the ward, with an abundant supply of hot and cold water. The water is raised into huge iron tanks, placed one in each of the towers of the building. From thence it is distributed in galvanized iron pipes to every part of the establishment. A large four-inch iron pipe carries the water from these tanks at each end of the wards, to a fire-plug which fits the city hose. The same pipe is connected with one of the steam-pumps in the basement, of a capacity greater than that of any city fire-steamer.

Just opposite the bathing-room, two shoots are constructed in each story. Down one all the dust from the ward is swept several times a day, and down the other all the dirty linen is thrown. This is collected at the bottom and carried to the laundry.

The source of heating is steam, from two tubular boilers in the basement of the laundry building, situated ten or twelve feet below the basement of the main building, so that the condensed water runs back to the boilers, without the necessity of forcing it in by pumps. Either boiler is large enough to supply the steam for the whole establishment. A main corridor of brick, about twelve feet square, kept perfectly clean, is constructed the whole length of the cellar of the hospital buildings, some four hundred feet. On the floor of this corridor the main steam pipe lies, and at convenient distances apart, smaller pipes,

at right angles to the main pipe and controlled by valves, convey the steam into *grilles* of pipes placed in brick chambers. In these the air which enters through the brick corridor is heated; and, in brick tubes lined with plaster, almost as smooth as glass, it is conveyed to the various wards and rooms. A fan worked by a twenty-five horse power engine forces the air whenever the peculiar state of the atmosphere renders it necessary.

The following is an explanation of the plan :

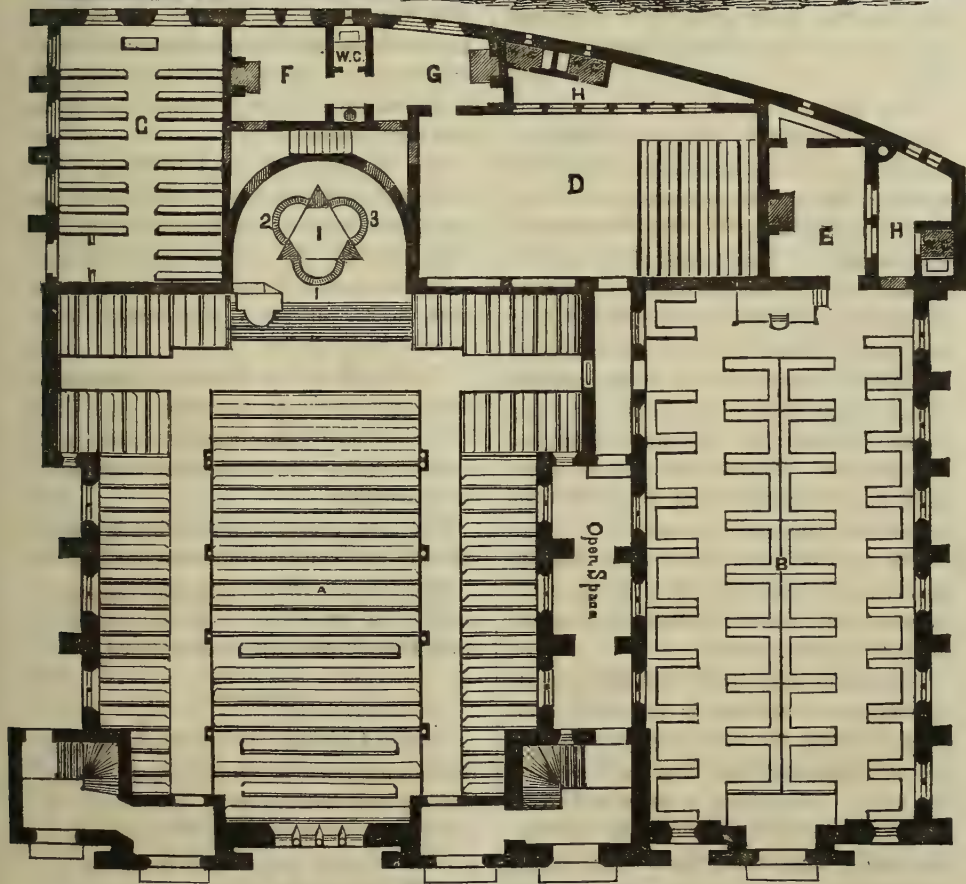
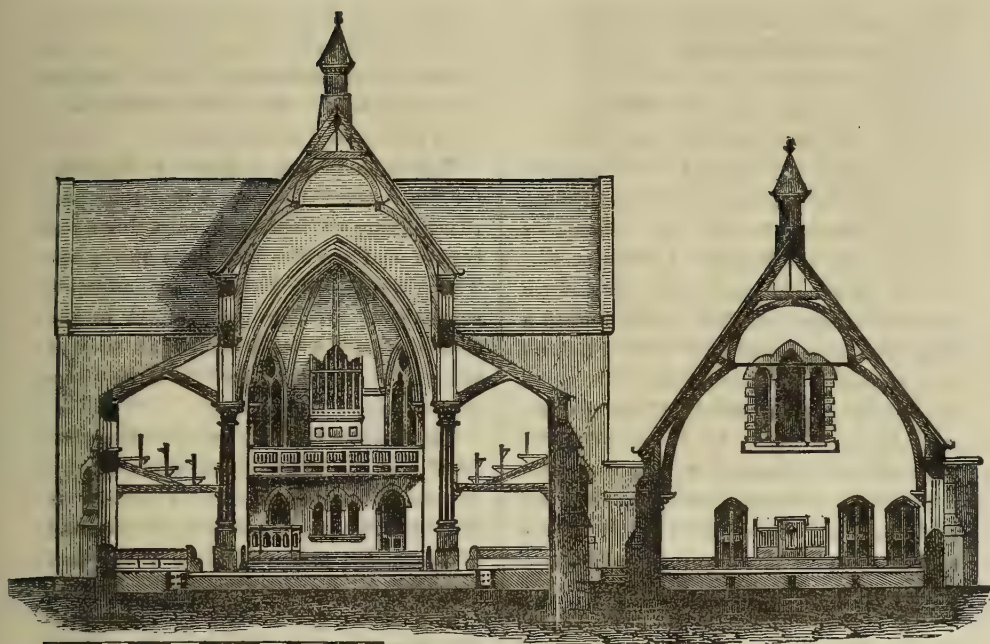
A, A, Open Arcades and Corridors. B, Hall and Staircase. C, C, Private wards. D, Lecture room, two stories in height, with gallery from second story. E, Officers' parlor. F, Officers' dining room, with pantry attached. G, Bath, lavatory and water-closets. H, Bay over porch. I, I, Pavilions, or public wards, 29 feet by 86 feet, and 15½ feet high. J, J, Stairs (of stone, and fire-proof.) K, K, Bath, lavatory, and water-closets. L, Nurses' kitchen. M, M, Dining rooms for convalescents. N, N, Private wards. O, O, Private wards. P, P, Bath and lavatories. R, R, Lavatories. S, S, Private stairs; (of stone and fire-proof.) Clothes and dust closets. T, T, Private wards. U, U, Patients' wardrobe. V, V, Lift. W, W, Water closets to private wards. X, X, Drying closets, &c.

The chimney for smoke and ventilation stands in the centre of the yard.

BAPTIST CHURCH AND SCHOOL.

DARLINGTON, YORKSHIRE, ENGLAND.

Our readers will remember that in Nos. 7 and 9 we gave as illustrations the Baptist Churches of York and Darlington, both in Yorkshire, England, the plans of neither of which had we been furnished with. Mr. WILLIAM PEACHEY, the Architect, has been kind enough to forward both to us, and we now present that of Darlington, which we think



PLAN AND SECTION OF DARLINGTON CHURCH, YORKSHIRE, ENGLAND.
WM. PEACHEY, ARCHITECT.

must meet the admiration of the profession in this country for its excellencies of arrangement.

The following lettered reference will explain the features of the plan:—A, Church. B, School. C, Lecture Hall. D, Class Room. E, Class Room. F, Minister's Vestry. G, Deacon's Vestry. H, H, Yards. I, Baptistry.

The plan consists of a cruciform Church, having parallel to its length a large School room 60 by 30 feet. Behind this School is an Infant Class Room 38 by 18 feet, and a Select Class Room, with separate yards for boys and girls. Behind the Church is a Lecture Hall for weekly evening services, 28.6 by 18.6, with a Vestry for the Minister, and another for the Deacons, with easy communication between them.

The Church consists of a Nave 58 feet by 22.6, with aisles 11.6 wide, and transepts 17 by 18 feet from face of Nave.

The Arcade is of brick, supported upon ornamented cast-iron columns. Above the Nave is a clerestory, with circular lights. At the end of the Nave is a circular Apse, in which is placed the Baptistry, constructed of stone and intended to be always open. The candidates descend the steps marked No. 1, and ascend Nos. 2 or 3, (according to sex;) the Lecture room and Infants' Class room being used as dressing rooms for male and female candidates respectively. Traps are provided in each floor to receive and drain off the water from the wet garments.

The apse is raised above the church floor two feet, so that the congregation may witness the act without any movement from their seats.

Above the Baptistry in the upper part of the apse, a gallery is provided, circular in plan, for the organ and choir; access being obtained from the lobby in the angle. A gallery is provided over each aisle of the church, and across the end; accessible from the front lobbies.

The front of the galleries is of pitch-pine, with Quebec pine panels in the bottom, and ornamental iron work in the top panels. The seats are all open; with pitch-pine, shaped ends.

The School room is shown as fitted up for the Sunday-school: A movable partition, some six feet high, runs down the centre, and divides the boys and girls. The classes are formed by movable seats made low for the comfort of the children, and fitted with backs, so that space is economized, and a large number of classes provided for.

The Superintendent occupies the platform, and the Secretary a table below. In the Infant Class room a gallery is provided for the simultaneous method of teaching; and the class room and Deacon's Vestry used for senior classes.

The Style is the *Early Decorated*. The exterior is faced with pitched or Rock face stone in about three inch beds, and of a gray color. The dressings are in freestone, of a buff color; giving a fine soft contrast.

The Spire is of wood framing, covered with vari-colored Welch slates in bands and pattern; and is surmounted with a weather-vane lightning conductor.

The windows of the School are glazed with lead quarry lights, filled with "Cathedral" glass.

The floors of the aisles are laid with tessellated paving, of simple pattern. The platforms where the seats are fixed are about four inches above the aisles, and boarded.

The total cost of the building is about £4,000, and the land costs about £500.

The Schools are erected, and the large one fitted up with seats for worship until the church can be completed.

TARDY JUSTICE.—Henry Kirke White, the young poet, of Nottingham, has at last had a testimony of his worth, in the shape of a memorial window and marble busts in the chancel of his favorite Wilford church.

BRONZE DOOR-KNOBS.

AMONGST the many improvements introduced, to beautify and adorn the better class of city dwellings and stores, COPPER-BRONZE DOOR-FURNITURE occupies a noticeable place.

It is presented in a number of styles for door-knobs: the Medallion, Scroll, Gothic, and the Cross, or "T," Handle; and there is a variety of Key Escutcheons, connected and otherwise, for Front, Vestibule, and Parlor-Sliding, or Swinging, Doors. There are also many patterns of Hinges, Bell-Pulls, Shutter-Bars, Sash-Lifts, Bell-Levers and Sash-Fastenings.

Electrotype Copper-Bronze requires no cleaning. The action of the atmosphere and the lapse of time tend only to heighten the effect aimed at in their manufacture; and whilst the cost is less than that of silver plating, the durability is greater; for the sheet of bronze, thrown into the mould by the battery, is thicker by many times, than the sheet of silver used in silver-plating.

Silver-plating, still preferred by some, contrasts finely with a walnut door; but it must be cleansed; and it is impossible to clean the silver without discoloring the door in the vicinity of the mountings.

Copper-bronze door-furniture would be nothing without walnut doors; and much as we admire copper-bronze, we must not lose sight of Walnut. Many of the doors and jambs made of this material are marvels of beauty in style, proportion, and finish. Architects have exercised their utmost skill, and joiners theirs, to produce some of the doors that have been hung in this city during the past season. There are residences in which the front, vestibule, and parlor doors, with their casings and hangings, have cost enough to build a complete dwelling, which the workman, who made the doors, would think very respectable and comfortable.

Hard, close-grained walnut is the kind

for doors. It is costly to have them made of carefully-selected wood; but fine doors are an important part of a fine house.

"Well supplied with all the modern conveniences," is the usual end of all recommendations and advertisements of messuages for sale or to let. The old style was: "Substantially built, dry cellar, and good water convenient." A home, with "modern conveniences," means one built substantially enough to last until the fashion changes, or encroaching business requires alteration, or-removal, of the tenement, with a dry cellar, kept dry by a large furnace or two, no stint of coal, good water, so convenient as to be found, both hot and cold, in almost every room in the building, and many other things, not dreamed of by the house owners or property agents of the olden time, such as gas, baths, water-closets, dumb-waters, speaking-tubes and bells, until it is a **LIVING MADE VERY EASY**, so far as the pile is concerned, by the combined ingenuity and labor of the architect, the builder, and their host of attendant satellites.

The mistress of one of these fine mansions hardly looks at her own premises; for everything must be kept in perfect order, without any apparent care on her part; and, with her bell and speaking-tube, from her boudoir, or dressing-room, to the servants' hall, she gives her orders for the day, herself neither seeing nor being seen. And, indeed, between receiving and making calls, dressing, dining, napping, and the opera or concert, there is left her but little time, and less thought, for the cares of a household. It is under these circumstances, that copper-bronze and walnut are invaluable improvements for the great world:—they are the most recent and highest styles, and kept from the appearance of soil and tarnish with the least labor.

Electrotype, copper-bronze door-furniture, and indeed, all electrotyping, arose in this way: About forty years

ago, the discovery was made simultaneously in Italy, Russia, and England, that two pure metals, holding within themselves different degrees of electricity, if made to touch each other at one end, with a wet cloth between them, would exchange electricity; and, if they were then united by metal at the other end, a complete circuit of electricity would be formed.

Subsequently, the discovery was made that, if this circuit were interrupted by any pure metal, that metal would be dissolved; and, at the opposite electric pole, the dissolved infinitesimal atoms would be recrystallized into solid metal.

A practical use was soon made of these two discoveries. Sheets of gold or silver were dissolved at one electric pole, in a circuit passing through acid water, instead of a wet cloth; and the gold and silver was, at the other pole, spread over the surface of works of art or daily use, thus constituting the process of electro-gilding and electro-silvering, or electro-plating.

Copper was, in the same manner, spread (technically, deposited) over the wax impression of a form of types; and, in a few hours, a perfect copy of the types was procured. Copies of medals and medallion figures were also made by the same process.

About twenty years since, wood-cuts, and the pages of books, began to be thus copied for the trade, in England, France, and the United States. To-day, the United States excel all other countries, in this branch of electrotyping, both in improved apparatus, and in its general use.

The more solid electrotypes, called copper-bronzes, have been used in Europe for several years. Antique bas-reliefs have been multiplied for wall pictures, for panel ornaments in doors and in pieces of furniture. Hundreds of architectural ornaments are made in the bronze, bronze-gilt and oxidized silver styles. In Paris, several imperial palaces are ornamented with these bronzes,

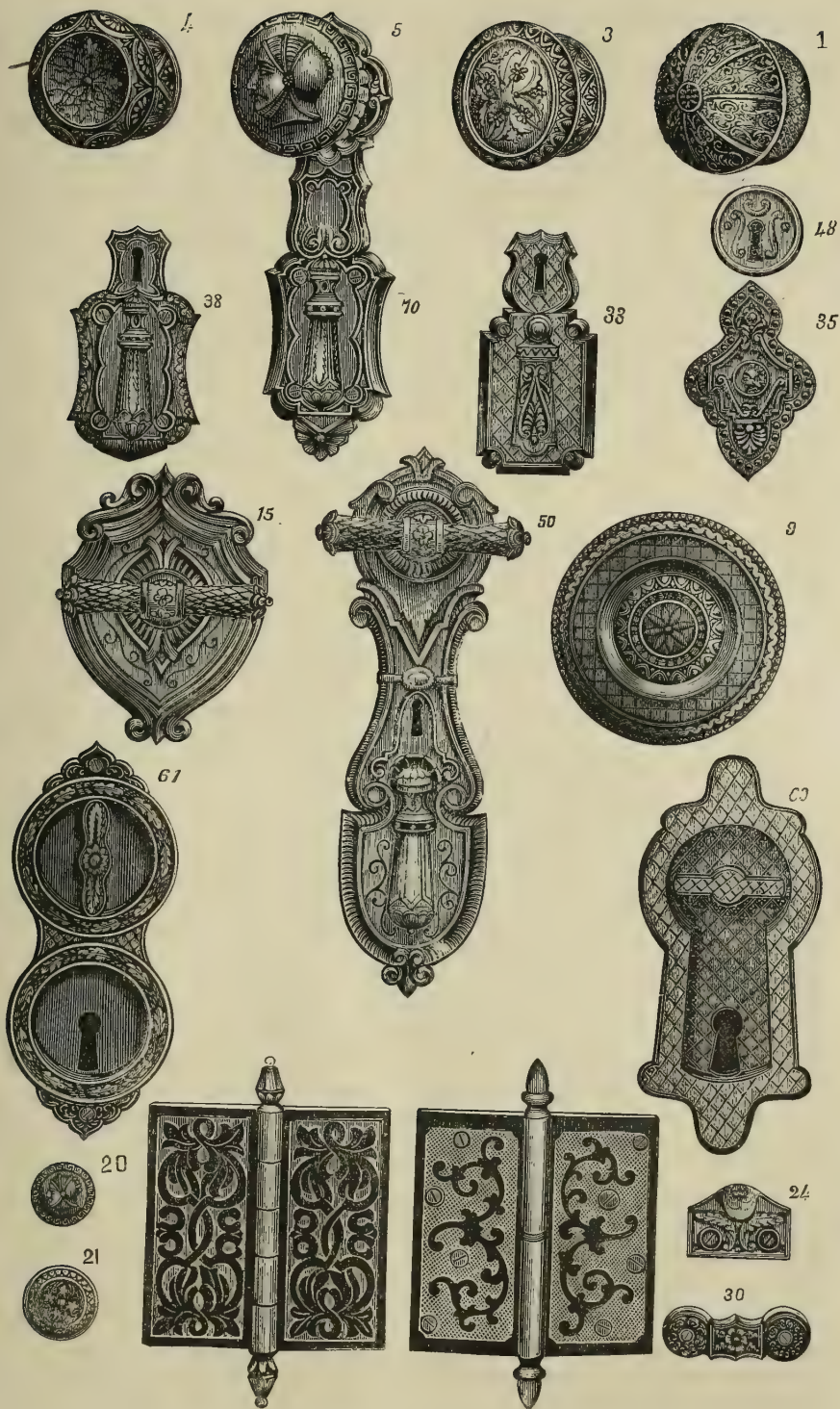
in inside walls, ceilings, doors, door-knobs, stair-railing, and household furniture—in fact, throughout.

In the United States, copper-bronze furniture ornaments, consisting of medallion heads and grouped figures, caryatides, and rosettes, were introduced into trade, about five years ago, by an enterprising firm in New York, and was first viewed by many as a doubtful venture. Like other experiments, that of the introduction of bronzes was expensive; and, at first, unremunerative; but such has been the progress of taste and expansion of fashion for these things, that, to-day, the popular demand justifies the creation of new models.

As it costs no more to electotype an elegant design than to duplicate a coarse pattern, these manufacturers find their interest to consist in frequently making a necessarily large initial outlay for tasteful models. They thus constantly reproduce, by the battery, all those beautiful, artistic touches, which, upon brass or bronze castings, only costly hand-labor can create.

The frequent visits of Americans to the capitals of Europe, tends to introduce among us whatever is really useful and true, in European taste, which may, with advantage, be Americanized. Prominent, among the educated and refined of the Old World, is the admiration of bronzes, either in the reproduction of antique subjects, or the efforts of the highest modern skill; and there is no better sign of American development than the steady growth of the same cultivated and refined partiality here for bronze articles of vertu.

Copper-bronze, door-lock furniture has won for itself an assured place in public favor. It is elegant in design and very durable, every article bearing a warranty. The first set of this furniture applied to a door in this city, was put on, some three years and a half since, and may yet be seen in good order. Many doors, of handsome residences here, have since been furnished with



BRONZE FURNITURE FOR DOORS

these ornamental bronzes, which give continued satisfaction.

Architects recommend these mountings; and they are entering largely into specifications for dwelling-houses and public edifices. The Treasury Building, at Washington, D. C., has three hundred and seventy-five sets on its different doors. The Park Bank, New York, has fifty sets on. The City Court House, New York, has one hundred and seventy sets.

During the past year, several thousand sets were manufactured and sold by Messrs. Smith & Butler, whose success has induced several parties to attempt imitating their bronzes, which they do in appearance, but not in fact; in form, but not in substance. These copyists make their goods of another metal, and coat it on the outside with a thin film of copper, which cannot be very lasting, or, at least, not so lasting as if the goods themselves were formed of copper, and able to rely on it for their enduring strength.

REFERENCE TO THE FULL-PAGE PLATE.

No. 1, a Gothic Knob and Rose, for Front Door.

No. 3, a Scroll Knob and Rose, for Front Door.

No. 5, a Medallion Knob and Rose, for Front Door.

No. 4, a Scroll Knob and Rose, for Parlor Doors.

Nos. 33 and 38, Front Door Main and Night-Key Escutcheon combined.

No. 70 and 50, Front Door Escutcheons, in which the Knob, Base, or Rose, the Night and Main-Key Escutcheons are combined in one piece.

Nos. 48 and 35, Small Front Door Night-Key and Main-Key Escutcheons, separate.

Nos. 9 and 15, two varieties of Front Door Bell-Pulls.

Nos. 60 and 61, two varieties of Sliding-Door Flush Cup, and "T," Handles, by which the Key may remain in the

Door, and allow the latter to slide clear back into the Partition.

Nos. 20 and 21, Sash, or inside Shutter. Knobs.

No. 24, a Sash Lift.

No. 30, an Inside Shutter Bar.

Two specimens of Embossed Parlor, or Front Door, Hinges, unnumbered, complete the plate.

COTTAGES.

LET any man be the possessor of a COTTAGE and GARDEN and he becomes a responsible citizen. Let that cottage be neat and tasteful, and the garden will under his hands be worthy of it; for, there is an innate pride in every human breast that dictates feelings of worthy ambition and independence which ensure a happy consummation of every wish.

He who has a pretty home, be it never so small, is proud of it, and will struggle hard indeed before he lets even misfortune rob him of it.

Every commendation of it by an observer is a source of pleasure to him, and tends to his improvement of it. Children are naturally fond of home, however homely. And if that sacred spot be pretty, the image of it is sure to be photographed upon their hearts for life, to be gazed in upon when other days and other scenes have separated them from it.

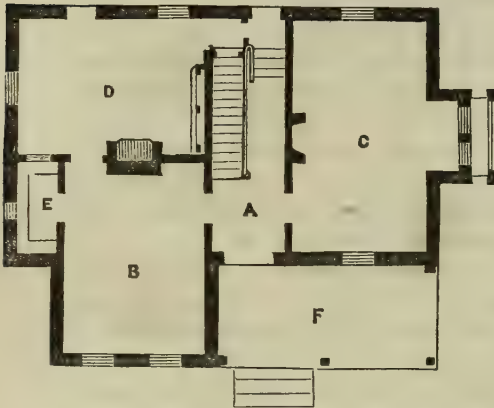
How necessary is it then to build tasteful cottage homes, which not alone embellish a neighborhood, but confer simple happiness far beyond that which wealth and a palace can strive to surround.

The Cottages here presented require no aid of description. The material in which to construct them will be that which the means of the owner can afford. If they are to be constructed of brick, the trimming may be of wood or stone, or even of brick of a different color. If they are to be of wood the construction may be of frame, with clap boarding on outside, or studded, lathed,

plastered, and gravel-dashed. Or, they may be formed of boards planed vertically, and their joints covered with slats. Another, and a very pretty method of constructing wooden cottages, is to run a string-piece along on a line with the window-sills, and fill the lower section with vertical boarding, as just described, and the upper part, to the eaves, with shingles or slates, having the angles squared off.

In the illustrations here given will be found some very convenient arrangements of plan. No. 1, is the ground plan of a cottage of moderate dimensions, so "broken" as to produce a pleasing effect in the perspective.

FIG. 1.



A, Is the Hall with Staircase. B, The Dining-room. C, The Parlor with bay windows. D, The Kitchen, with egress, under the Stair-landing, to the yard. E, The Pantry off the Dining room. F, The Piazza.

No. 2. Gives the same accommodation, but in a very different form. A, The Hall and Staircase. B, The Parlor. C, The Dining-room. D, The Kitchen. E, The Pantry, convenient to both kitchen and dining-room. There is a back door at the end of the hall, as in the preceding plan. The dining-room in this cottage is a well-lighted and very cheerful apartment. F, Is the Piazza, with its approach and landing.

No. 3. Is still another arrangement of the same amount of space. A, Is the

FIG. 2.



Hall, with staircase and back entrance. B, Is the Parlor, with spacious bay-window. This is a uniform and well lighted apartment. C, The Dining-room, off of which is a square vestibule through

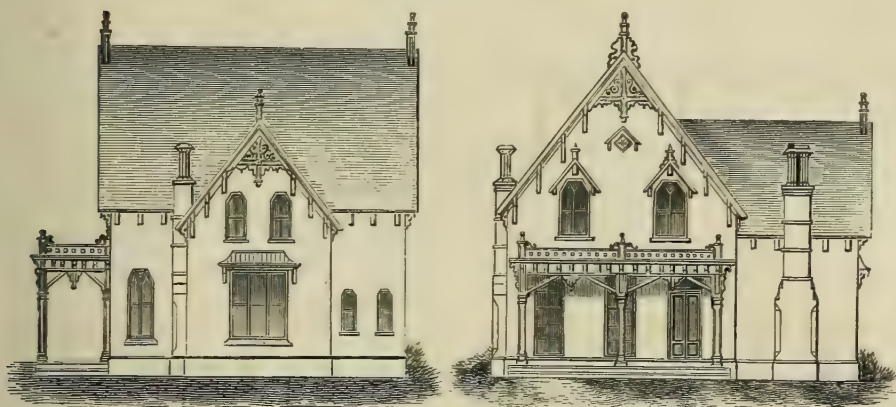
FIG. 3.



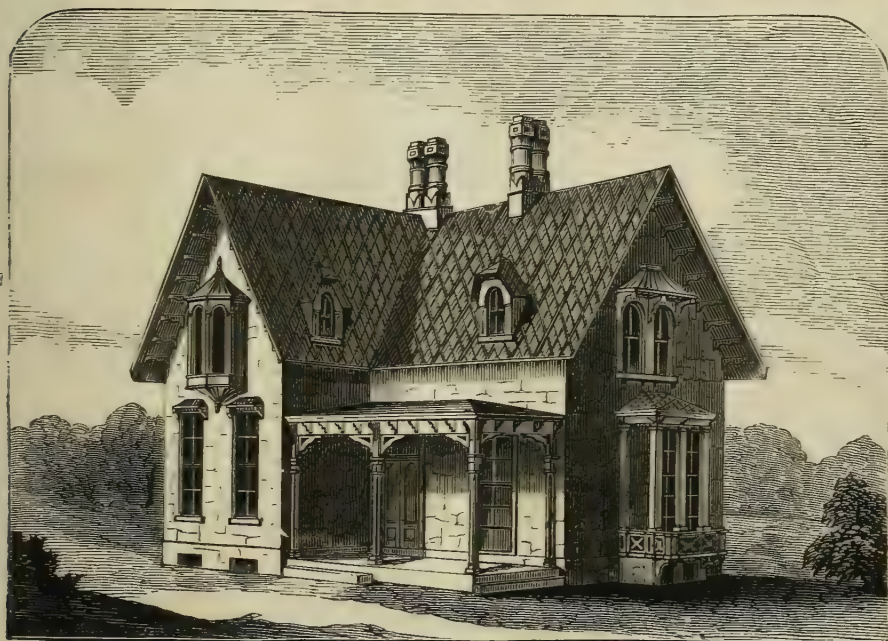
which communication is had with the kitchen, hall, and yard, and which effectually cuts off all disagreeable odors from the cooking department. D, Is the Kitchen, having a back door leading to the yard. E, Is a Pantry off of the kitchen, and F, a Pantry off of the vestibule. G, Is the Porch, with its approach steps.



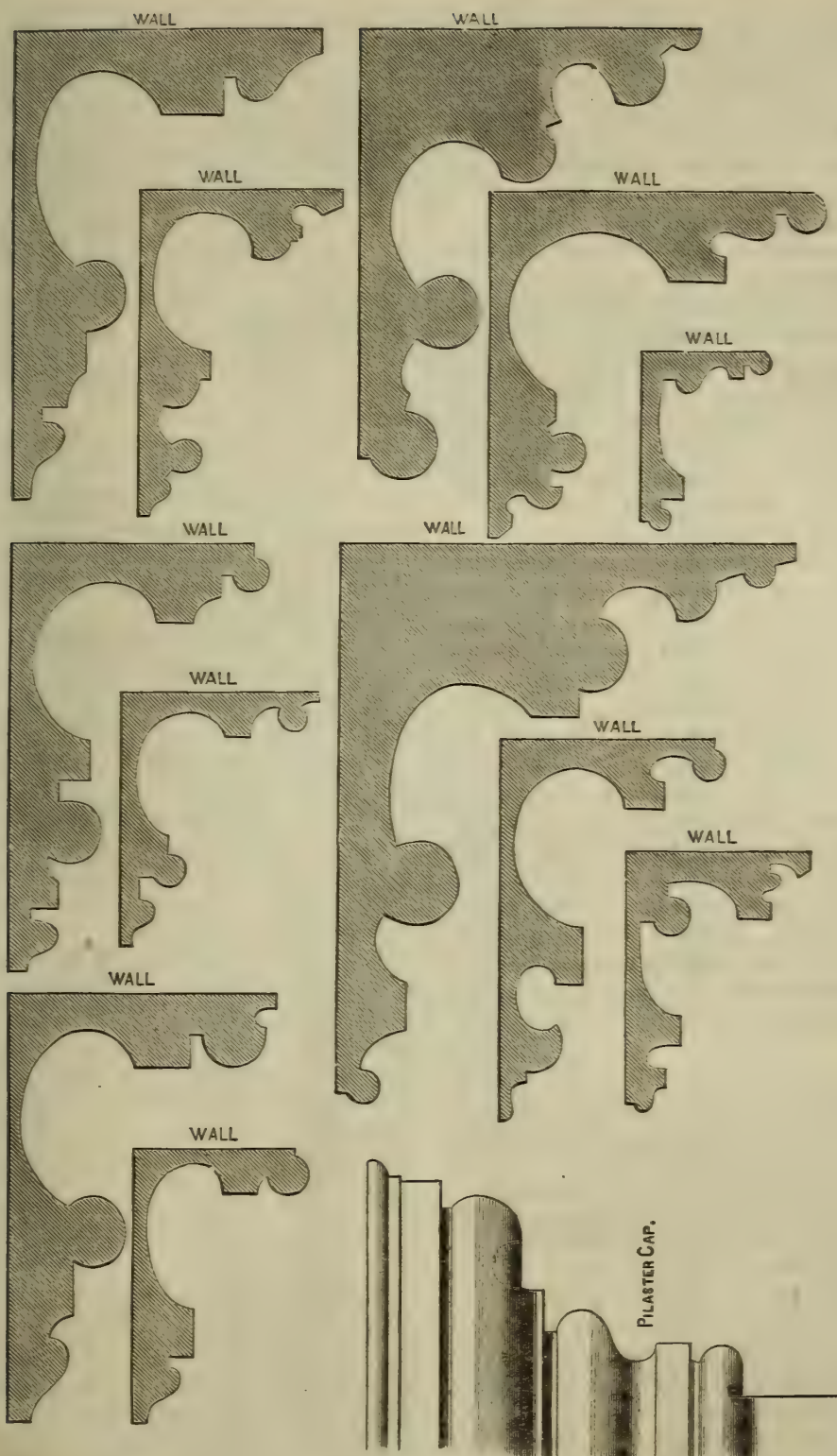
No 1



No. II.



COTTAGE.



CORNICES FOR ROOMS.

CORNICES FOR ROOMS.

THE accompanying plate is intended to illustrate this subject in a diversity of forms, especially those most in use in modern building.

In former days it was the common custom to cover the cornices of the principal rooms with raised enrichments. Elizabethan Architecture was highly decorated in this department, and many very beautiful specimens yet remain in England of those master-pieces of art. In our day the taste appears to lean to grace of curve, acquirement of light and shade, with justness of proportion. In a word, to simple beauty.

As however, the ornamentation of cornices is often introduced in certain styles at this day, we propose to give an illustrated article on the subject in a coming number of the REVIEW.

It is not an uncommon practice with stucco-plasterers to use and re-use the same moulds, under all circumstances, if they only fit the price of the required work. This is very wrong. The *Style* of the cornices should be in keeping with the building they belong to; although a diversity of *orders* is permissible. Of course there is no danger of any such bungling where an architect superintends; but such is not always the case.

ARCHITRAVES FOR DOORS AND WINDOWS.

NOTHING in joinery so sets off an interior as well considered finish. For, unlike exterior work, it is more likely to be well and constantly inspected. In fact it is the permanent furniture of the rooms, and stamps at once the good or bad taste of the owner, or his architect.

The Architrave for doors, here shown, is bold and simple, containing the lines of the plinth unbroken; and

thereby giving to the composition that pleasing unity of design which belongs to a perfect whole.

This effect of symmetry is especially observable where the door or window head is segmental; and in the case of square-heads the angles might, with good taste, be treated as quadrants.

The mode, so frequently followed, of introducing jogs or off-sets is not at all as conformable to taste as is that which we here present, and of which the following is a description:

A, Is the ARCHITRAVE OF A DOOR, with fascia and mouldings.

B, The base or plinth, with its sub-plinth, and a section of same.

C, Is the door-head, or cap; which is shown as a flat head with quadrant angles, having a butt joint.

D, Shows the plan of the door architrave, together with its construction.

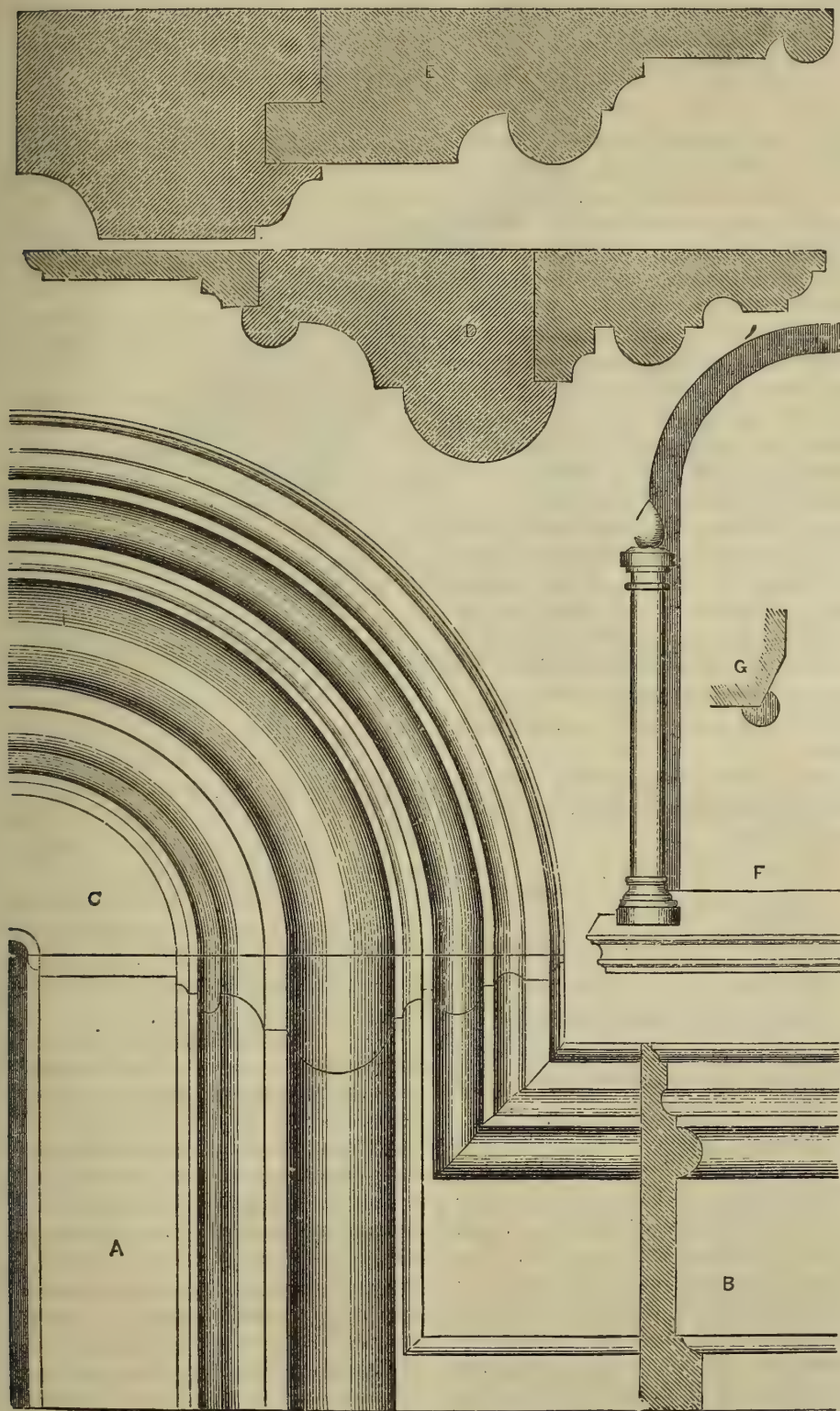
E, Shows the plan of another design of architrave.

The prominence of the *Torus* moulding in this design gives a desirable appearance of strength to the construction, and this member may be *roped*, or interlaced with vine leaves, or in fact ornamented in any way conformable with the nature of the design.

F, is a WINDOW-ARCHITRAVE showing a bevelled reveal and ornamental angle-staff for the protection of the corner-plastering. It is three-quarter round, has a capital and base, and may finish with any ornament, such as a pine-apple, or the like.

G, Is the plan of the reveal and angle-staff.

SOLOMON'S TEMPLE.—Lient. Warren, who is conducting the explorations at Jerusalem, has made some recent discoveries which he thinks may soon lead to his ascertaining the position of the temple. At all events, the space within which it must have stood is somewhat limited by these new discoveries.



CONCRETE AND BÈTON.

WHEN it was first introduced as a mode of construction, CONCRETE created a sensation, and drew forth various essays on its merits. For a sound sub-stratum on which to lay foundations, nothing could be better. It was not alone worthy of notice for its cheapness, ease of formation and economy of time, but also for its entire reliability as a material in underground construction; and we may add that its utility and excellence in the formation of sea walls has been most thoroughly tested both in this country and in England. Certainly in the latter it has been found that although it becomes intensely hard as a backing, it is more or less affected by the action of the sea-water on its exposed side. This, however, is by no means a fatal objection, as a facing of blocks made of cement-concrete is sufficient protection from such action.

The specific gravity of concrete, as compared with that of other materials, is as follows:

Concrete weighs to the	
cubic foot about	140 lbs.
Brickwork,	110 "
Granite,	160 to 170 "
Limestone,	145 to 150 "

Concrete, as made of quick-lime, is composed of the following proportions:

Broken Stone 7 or 8 ounces	{ 80 parts.
in weight each,	
Sharp river sand,	40 parts.
Quick-lime,	10 "

The Lime is to be mixed with water to the consistency of thin cream and grouted into the other ingredients. The mass is to be then worked up thoroughly and used at once. Some prefer mixing the lime, ground fine, through the other materials, and then throwing on sufficient water. It should then be turned over briskly with shovels, put into

barrows, and wheeled away for instant use. It is advisable to employ two sets of men to perform this operation, with three men in each set, one man fetching the water, &c., while the other two turn over the mixture to the second set, and they repeating the process, turn over the concrete thus mixed to the barrow-men. It should be wheeled up inclined planks to a height of some yards, and dumped down into the trenches. This fall is most desirable, as it forces the mass together, and drives the moisture to the surface. Soon after being thrown in, the mixture shows considerable commotion, and vapor arises, as is usually seen after the slaking of lime.

The concrete should be thrown on in layers, the first being allowed to set before a second is thrown on. A barrow load, spreading over the ground in its fall, will form generally from seven to nine inches thick, and a cubical yard of concrete will take about thirty feet cube of material and three and a half feet of ground lime, with a sufficient quantity of water. Of the latter no more should be used than is absolutely necessary to effect a perfect mixture of the ingredients. Hot-water accelerates the induration.

In answer to correspondents who request information on the subject of concrete as a material for construction above ground, we would say that if properly manipulated, there is strength and durability in this composition; and although a recent failure of a public building, constructed of a certain description of small blocks called by the name of concrete, has brought down upon it the marked displeasure of some, the public have too many standing testimonies of its strength to condemn it on this account. The fact is, the "concrete blocks", as they are called, have weak-



A COUNTRY CHURCH IN CONCRETE.

ness in their very form. We allude to the hole in the heart, which is meant for purposes of ventilation, but is fatal to the first principles of strength. The proportion of lime to that of sand is not sufficient for the perfect cementation of the mass, and we do not believe that any amount of pressure can prove sufficient to make up the deficiency and produce the requisite cohesion.

But, the failure of these very neat looking "blocks" is no argument whatever against concrete as a constructive material above ground. It is simply a proof of the absurdity of endeavoring to over-refine a mere principle, and to make a theory carry more than is practically safe.

CONCRETE, to be enduring and capable of bearing superincumbent pressure, must, as we have already said, be composed, in three distinct parts, of broken stone; coarse, sharp or siliceous sand; and good, lively quick-lime. The pro-

portions of these three materials are so calculated as to leave no void in the mass and to bring all perfectly together. We will now proceed to specify the necessary operations, and to that end present the above illustration of a country church executed in concrete.

The trenches of the foundation being filled to the surface of the site, the whole will be levelled off all around, and four moulds, previously prepared, placed one on each wall. These moulds will be formed in the following manner: Take well seasoned pine-boards an inch and a quarter thick, and cut them into lengths of three feet; clamp them strongly, with say three stout clamps. Groove them on the inside within three inches of the extremities, and fit into these grooves two ends, an inch and a quarter thick. In order to secure the whole, rods of iron, of about a quarter of an inch in diameter, will be run through from side to side, above and below, out-

side the ends. These rods to have nuts and washers, removable on one side, permanent on the other. The movable nuts to have handles, so as to facilitate their management. The interior dimensions of these moulds or boxes might be thirty inches long by fifteen inches wide, and twelve inches deep. When it is deemed advisable to lessen the thickness of the wall, new end pieces of the required dimensions are substituted, and the gauge is ensured.

The first course or round of the walls is to have water-lime in solution, instead of quick-lime. By this means the damp arising from the ground will be effectually prevented.

The work of wall-raising should be commenced at the corners or quoins, and go round one way; that is, either from right to left, or, from left to right, observing to leave an interval between each position of the moulds. And when the walls are gone round in this way, put the sides of each box (leaving out the ends) against the newly formed blocks of concrete, so as to enclose the intervals that were left, and fill and pack these soundly, so as to form one unbroken course. When this course is finished, proceed with the next, [observing to break joint throughout] for although the whole would seem to be one homogeneous mass, yet in the setting, if any shrinkage will occur, it must be at the joints. The window and door frames should be, in breadth, the thickness of the wall, and let the concrete be worked up to them. The pointed arches over all opes, may be of brick or stone work. The buttresses on the angles may be of masonry; as also the porch and belfry. The roof may be of shingles, but if of slate, so much the better.

When the roof is finished, the walls may be coated with water-lime cement and sand, equal parts, and the work kept wet during the process. Or, finely powdered brick, four parts, powdered quick-lime one part. Mix with fresh animal blood. Or, sand and lime may be

used with blood. But it is necessary to slake and cool the lime before putting in the blood.

There are other compositions for outside covering, and it is very necessary that one should be used, as the liability of concrete, when unprotected, to absorb wet is a serious disadvantage. To this end also the roof should be made to project sufficiently to shed the walls from the falling rain.

The inside of a concrete building is capable of receiving a mere skim coat, and looking well.

On the whole this material is not desirable for building above ground, if wood, brick, or stone can be had. It is only, at best, a *makeshift* in the absence of the more fitting material. But, as there are some parts of our country where the use of it is an economic necessity we make it a subject for our pages. There is a common practice amongst builders in concrete to put up *wooden trenches* around the whole of a building, in which to cast the composition without joint. This is not at all as good a method as that which we have described, of *moulding boxes*. For, there is in the former a very great difficulty of avoiding swellings in the wall; or in fact of keeping the work straight. It is, moreover, far more troublesome and dirty than the latter. The expense of making the moulds is repaid in the repeated use of them in other buildings. In the construction of fence-walls, concrete may be made to serve a good purpose; but they should be carefully finished with a sharp saddled coping, sufficiently steep to freely shed the rain water, and protect the wall. Such coping or covering should be of shingles, slates, boards or flag stone. If of boards, or shingles, a good coat of gas-tar thickly sprinkled with fine sand, would be desirable.

BETON is of French invention and is nothing more than concrete of another form. Indeed it is used by the French engineers more as a material for hydrau-

lie purposes than anything else. For sea-walls and the like, it is excellent, for it will effectually resist the action of the water, which English concrete does not.

Our American concrete is more like the French composition, inasmuch as we use water-lime cement in the making of it instead of the common lime for hydraulic purposes.

For building above ground *béton* is excellent, though, of course, more expensive than simple concrete where quicklime is the binding agent. The method of moulds we have already described will be the fittest for its use, and the only difference lies in the composition of the material. *Béton* should be made of

Broken brick,	7 parts.
Sharp sand,	3 "
Water-lime,	2 "

Mix the sand well through the broken brick. In a box, prepared for the purpose, dissolve the water-lime, making it of the consistency of thick cream, and throw the mixed brick and sand into it. Work it speedily and turn it into the

mould on the wall. As *béton* sets rapidly it will be necessary to mix it near to the mould, and only in the quantity actually wanted for immediate casting. Pack it well down at the sides and ends; and it will economize the material and help its solidity to also pack the heart with large pieces of clinker brick.

As the moulds are taken off and the courses complete, all holes may be plastered up with cement mortar, and the face made even.

If sunk joints (bevelled or square) are required on the outside face, wooden moulds suitable to the purpose are to be tacked on the inside of the moulding-box. Where flooring-joists rest the *béton* is to be packed around them solid. Chimney flues may be made circular with great advantage. Houses constructed of *béton* are remarkably cool in summer, and warm in winter, and must therefore be healthful in an eminent degree.

As to their comparative cost we can only say that it depends altogether on the price of *water-lime*.

DESIGNING COMPETITIONS.

WE cannot think of any more appropriate designation, for this curse of our profession, both in England and here, than that which heads this article. Here it has not become so constant a nuisance, as it is, and has been for many years, in England. But it *has* shown its bold, brazen front, amongst us; and it becomes the duty of the ARCHITECTURAL REVIEW, as a national advocate of the just rights of the profession, to denounce it, as a demon of discord in our midst, begotten and sustained by speculation and swindling, rendered more abominable, by a simulation of liberality, which is most foreign to its true intent and object. In England, every little knot of rate-

payers, or others, who have to erect any small parochial concern, instead of honestly employing a respectable architect, and paying a just fee for his services, fly to a newspaper, and insert an advertisement, offering, as a *reward*, one-third, or one-fourth the value for the *best* of any number of competition designs for the proposed structure. Of course, there are always a number of strugglers, ready to dash into the contest headlong, and exert all the ability they possess (which is often considerable) in doing what? Why, in affording the before-mentioned sleek parochial gentlemen the very acceptable favor of a supply of varied ideas, they never dreamed of, which will, of course, be

culled, and put together, in an eclectic set of plans, elevations, and sections, by that original genius, who may have the "honor" of being their particular *pet* architect, as pre-arranged by these select men. The *prize* is his, and the crowd of competitors fall back to meditate on their own confiding short-sightedness, and the rascality of those, to whom the honor of an honest community is too often entrusted.

As yet, it is seldom those competition delusions are put forth here, to snare American architects; but, in the few instances they have been temptingly hung out, the amount of bitter disappointment, which was the only return to those, who too liberally spent time, money and brains, upon designs, which they each fondly hoped would surely be successful, will leave its indelible mark upon their memories, and cause a bitter retrospect that may yet prove salutary, when the crisis comes, as come it must, and the profession shall speak out, in fitting indignation against this hypocritic cheat.

This game is generally so adroitly played, that, notwithstanding the bribery and corruption, which too frequently underlie the whole scheme, the surface seems as clear and inviting, as though no monster lurked beneath.

The evils of this system, too mischievous to be utterly contemptible, were forcibly brought to light, lately, by an investigation in the Illinois State Legislature, at Springfield, connected with the building of the New State House. Whether the whole matter is a mere political muddle, it is not our business to enquire. But, we are certain there is to be very distinctly seen in it a most reprehensible spirit of unfairness, as far as the competing question is concerned. We trust, that the thorough ventilation of the whole affair will have at least the effect of warning those, who would, in future, be inclined to listen to the syren sweetness of those liberally disposed "friends of art," who hold

out *golden apples*, rotten to the core, as inducements to them to enter into hopeless competitions.

It is some consolation, to see that these schemes by unprincipled politicians and others to enrich themselves on the honest efforts of twenty competing architects, involving some thousands of dollars of outlay, not to speak of the mental strain upon their inventive powers—are likely to be fittingly denounced, and the perpetrators of such frauds held up to public scorn.

Is not this a time, for the profession, throughout the length and breadth of the land, to combine and unanimously resolve not to meddle with such competition invitations, in future, no matter how glittering the knavish bait may be.

If Building Committees do not think they can procure, from any one architect, all that is requisite to make, what they consider to be a perfect design, let them also employ another and, if need be, another, paying these several gentlemen their full professional charges. Let them even select an architect, to work up into a desirable shape the different ideas they have thus honorably obtained; and all will be satisfied. At least no one will feel, that he has been defrauded and fooled.

But, cannot Building Committees find one architect, who, of himself, will produce such a design, as can, with due study, be made perfectly satisfactory? It is not very complimentary, to the present status of the profession, if they cannot; and we say, emphatically, that *they can*, if they will try. But it does not suit them. Every member appointed on a building committee, or commission, has a friend, or a friend's friend, whom it is desirable to oblige; and each has a certain amount of wire-pulling to do, in order to drag in the friend's "design" without reference to any practical claims, which that design may possess. Not a word about bribery.

There is another matter, which we desire to draw attention to, before quitting this uninviting subject, for the present. It is this :—In laying out the “diagrams” and “instructions” for competitors, the unfortunate architect, who accepts these “bonds” as final and conclusive, will find himself sadly mis taken, for they are seldom or never adhered to. We have a personal recollection of a requirement, once laid on a large number of competing architects, that the principal fronts of a proposed public building, of great extent, should be

placed on a Northern street ; and lo, the prize was carried off by a daring innovator, who, for *private reasons*, best known to himself, reversed the edict ; and made the Southern street the grand front location. Was there no secret understanding in this contumacy ?

No doubt, many of our readers have personal recollections similar to this ; and we only advert to the fact now, to show how utterly false and unreliable are these “invitations” to architects, to spend time and money foolishly, if not stupidly.

ARCHITECTURAL INFLUENCES.

BY T. H. WILLIAMS.

TO the man who goes through life with his eyes open to the singularities with which he is surrounded, and who is cognizant of the “little” wonders of the world, as well as of the “great” ones, it is a matter of amazement that no two faces on the Globe are precisely alike. They may bear strong resemblances ; may when viewed separately, appear to be similar, yet a close inspection reveals the difference in the expression of some feature, which materially alters the face. A line, a wrinkle, a shadow,—the elevation of an eyebrow, the distention of a nostril ;—any of these is sufficient to change the whole expression of a countenance, which might else be regarded as the counterpart of some other face.

So also with the infinite variety of architectural styles which confront one in the course of travel. It is hardly an exaggeration to say that no two buildings are alike, for the slight variation in the tastes of the constructor, when worked into and through the intricacies of a building, are amply sufficient to change the *tout ensemble*, and render its likeness to any other building comparatively slight.

It may be asked, and with much show of reason, whether we have (in this country especially) any edifices built in accordance with the rules of a pure style of Architecture, and whether the very fact of taste being admitted in the construction, does not destroy the possibility of our possessing pure styles.

The innovations thus made, while they undoubtedly give us a spice of variety, and perhaps tend to relieve a city of much tiresome monotony in its aspect, must also result in the production of what might be termed mongrels of art, to which no art-student, or no lover of pure taste can give his unqualified sanction, yet the question arises whether it would be wise to attempt to eradicate this system, or rather *want* of system in our American communities, and whether, if we should attempt to do so, we should not meet with incontinent defeat.

It is not to be denied that all adornments, external or internal,—all additions to, or variations from, a given style, are but the effects of some cause to which we may readily trace them, and from which they are as *directly* derived as were the pure styles themselves,

from influences which an examination of the subject will reveal. Prominent among these influences are Religious Belief, Climate, Government. Others of less force, but yet exerting material power, might be named in large numbers, and if we should attempt an exhaustive examination of the subject, we should doubtless find it impossible to omit any one of them, without making a break in our deductions, which would interfere greatly with their logic. But we can discourse upon general principles without entering into these *minutiæ*, and a cursory glance at the subject will show that, the three influences above named, are the great original causes of those effects which we denominate Architectural Styles.

With regard, then, to Religious Belief, (we are tempted to say Religious Prejudice,) it is generally conceded that men—whether Christian or Pagan—are more intolerant, less willing to open their minds to conviction, and more obstinate in the maintenance of their particular theories, respecting it, than in any other matter upon which it is not possible for all mankind to agree. They will set up a false dogma at the sword's point; they will fight battles, commit murders, give up *life* in support of an exploded creed; they will infuse their religion into their literature, weave its symbols into their garments, and *build* it into their edifices.

Under these circumstances it is hardly surprising that we should find Religious Belief a great primary source of national architectural style, and that from long usage, a people's tastes and preferences should be moulded into those channels most in accord with the requirements of their prejudices.

An idolatrous people, viewing all things from the stand-point of their highest ideals, and regarding a golden bull, or a stone sphinx-head, as not only a manifestation of divinity, but as a very god incarnate, naturally introduce these deified animal figures into their buildings,

both as a propitiatory offering and mark of reverence, and as having more power than aught else to awe into quietude the otherwise troublesome aspirations of the superstitious.

On the contrary, other nationalities, as, for instance, the Moors, from their abomination of the lower forms of idolatry, are forced to eschew animal figures entirely, and introduce emblems of vegetable life—plants, flowers, and fruits—as a means of adornment. Even these are not at all times sufficient, for in the Arabian Architecture the eye is continually struck by cabalistic geometrical figures, arranged in the most singular manner,—figures which might be termed mathematical impossibilities, but whose well-cut lines serve well the purposes for which they were intended, and thus relieve the whole structure of that monotony so distasteful to a cultivated eye.

The rise of this style was nearly simultaneous with that of Mohammedanism, and it is to be remarked that it has ever followed that religion, although, singularly enough, its origin seemed rather to be a mere matter of chance, than the result of any pre-determined system.

It is a matter of history that the first Mohammedan mosques were designed and built by Christian architects from Constantinople and elsewhere, and to this fact we may trace the resemblance which exists between this style and the Byzantine. The Moors, however, by the subsequent introduction of arabesques, and the great profusion of fanciful devices, (a trick which they learned from the Greek and Roman edifices,) considerably modified their structures and rendered their style distinctive.

The horse-shoe arch, with which we have become so familiar as to expect it as a matter of course in all diagrams of Moorish gateways, &c., was undoubtedly original with them, and for some reason has always remained their own particular property, although its beauty and *grace* are generally conceded.

Parker's, "Glossary of Architecture," asserts that the pointed arch is to be found in Mohammedan buildings as early as 780, A. D., although the earliest examples of its use in Christian Architecture occur during the twelfth century.

The finest specimen of the Moorish Architecture extant, and probably the noblest result of the style ever attained, is the "*Kal-at-al-hamra*," (Red Castle,) the citadel of the city of Grenada.

This superb pile, commonly called "Alhambra" from a corruption of the Arabic name, was the palace of the Moorish kings, and is so well known to all readers as to render unnecessary any detailed description of it. The delicate airiness of its outlines, the elegance of its columns and arches, the grace of its pinnacles, and the gorgeous colorings of its tessellated floors, are so many lasting monuments of the taste and voluptuous refinement of the Moorish sovereigns who flourished from the middle of the thirteenth to the middle of the fourteenth centuries.

It is the very place to inspire the fancy with romantic imaginings and fill the mind with legends of forgotten lore. Even our own countryman, Washington Irving, loved it as he loved few other spots; he lingered affectionately week after week amid its halls and gardens, and trod with a feeling akin to awe its beautiful terraces; he lounged lazily in the "Court of Lions" during the haze and heat of a Grenada day, and wandered at night, gazing with admiration at the splendid but decaying beauty of the "Tower of *Las Infantas*."

Into his historical description of the Alhambra, he has so blended the beautiful legends of the place, and in many instances has given such free scope to his own poetic imagination, as to render it one of the most charming of his works.

The Alhambra is indeed an outgrowth of the theories and doctrines of the Moors.

A people warlike,—*barbarous* in war;

—they nevertheless possessed in many cases the quintessence of refinement during peace. They were thoroughly susceptible to luxury and elegance, yet because they had the nerve to drop all this when the time for vigorous action came, we call them barbarous.

That they were savage in war, any one who has read the history of their invasion of Spain must know; that they were refined in peace, is proved by the gorgeous yet elegant conceptions of the Alhambra; that they were unswerving in their religion, and rigidly observant of its forms, is shown not only by their written history, but by the careful exclusion from the ornaments of the same building, of all figures and devices, save those in strict accordance with the Mohammedan creed.

Here is an instance in which architectural style is not only influenced at the start by religious belief, but in which the effect of that influence is maintained and augmented by the further development of the belief. Any material changes which occurred in the Moorish (Arabian) style, between the time of its birth and the erection of the Alhambra, are ascribable solely to the different interpretations and constructions which, in course of time, naturally come to be put upon the original dogmas of a church.

We find this to be the case in Christian churches, and out of respect to ourselves and our profession, cannot wonder at in Pagans. Mohammed gave certain commandments and enunciated certain theories, but the *savants* among his followers, in course of years, thinking doubtless that they now saw by a clearer light than formerly, prescribed forms and regulations which, though possibly at variance with all pre-conceived notions, were adopted as being the true intention of the Prophet.

With respect to the Architecture of the Greeks, there can be little doubt that its details were as much the result of the national religion as was its origin.

The gods and goddesses of their early mythology had all the forms and attributes of mankind; hence we see that the Greeks continually aimed at a reproduction of deified humanity. It is even said that the origin of the Doric style was merely the result of an attempt to combine something resembling the human figure, with the massive uniformity of a column, for instance, a sturdy peasant, showing strength with plainness of appearance. On the same principle, the Ionic order was typical of the more graceful and less severe proportions of a woman.

We have a still more forcible illustration of this idea, in the use of Caryatides, which, although derived from Egypt, were introduced as *pillars* only by the Greeks, the Egyptians merely using them as statues *in front of* the pillars. Many highly poetical, but decidedly improbable theories with regard to the origin of the Corinthian capital have been brought forward, but where opinion is so much divided, we may as well attribute it to the desire to typify the bounties of Flora and Ceres as to any other cause, and settling comfortably under this conviction, conclude that we have discovered another indubitable proof that religion was at the bottom of the whole matter.

The oldest specimens of the Doric order extant, are the temples at Corinth (650 B. C.) and at Egina, (550 B. C.,) in both of which we may see the imposing effect, which (because of its very simplicity) this style produces. In the temple of Corinth, however, the great massiveness is thought to exist to excess, and it is probable the Greeks thought likewise, for in the Parthenon (the finest example of the style) the proportions were considerably modified, the columns in the former temple being only 4.47 diameters in height, while those in the latter were erected to an altitude of 6.025 diameters.

Had the modifications ceased at this point it would have been well, but like

many matters in our own days, the Greeks continued their "improvements" until they came into the opposite extreme, and, in several of their later edifices, lost much of the boldness formerly characteristic of the Doric style, by the attenuated columns and general meagreness of outline which they introduced.

The Ionic cannot be deemed as pure a style as the Doric, inasmuch as it was in a great measure derived from it. The additional grace which it possesses may be regarded as the result of an increase of refinement, or, perhaps, effeminacy, in Greece. The stern simplicity of the Doric had become too severe to suit the increasing cultivation and elegance of the Greeks, and it is for this reason that we see the rise of a more congenial style, about the end of the sixth century B. C.

We find the further development of this disposition in the invention, or rather introduction, of a yet more elaborate order of Architecture,—an order which, although possessing the characteristics of both the preceding ones, is nevertheless, in its general effects, entirely distinctive from either.

In the temple of Jupiter Olympius, at Athens, we have an admirable specimen, (the best in existence) of the Corinthian order.

That it is beautiful none will deny, but most persons will agree that what is added to it in this respect is deducted from the appearance of grandeur which the other orders exhibit, and the feelings of awe which they inspire.

Such feelings, however, are induced to a yet greater degree by the Gothic, than by any of the Greek orders. An intelligent writer upon the subject makes a fine definition, and draws a delicate comparison between the two, in denominating the Greek temple, an embodiment of the abstract conception of all-pervading Deity, while the Gothic cathedral shadows forth the religious aspiration after a *personal* God.

It is further remarked that "the distinctions between heathen and Christian thought, could scarcely be more distinctly stated in words than they are exhibited to the eye in the difference between a Greek temple, and a Gothic cathedral. Even the relation which subsists between Christian and Mohammedan Architecture, strikingly reminds us of the fact that Mohammedanism was but a sort of bastard Christianity."

These remarks are singularly true, and might well be extended further by the citation of other examples.

The word "Gothic," as applied to Architecture, is so comprehensive as to render an exact definition of it difficult to give. It comprises all the styles which prevailed in Great Britain, and indeed in the whole of western Europe, during a period of nearly four hundred years. and as the name is of subsequent invention to the general styles it is used to designate, it is easily seen that its signification must be of a very extended character. The word originated with the Renaissance architects, being used by them as a term of reproach, and applied to the mediæval architecture which existed from the middle of the twelfth to the middle of the sixteenth century, and which, consequently, immediately preceded the revival of the classic styles under the name "Renaissance."

As to origin, the Gothic is as undoubtedly indebted to religious sentiment for it as are the other styles at which we have glanced. Although considerable difference of opinion exists, it is most probable that the style was derived directly from nature, the arches and groins being but a copy of the over-arching branches of the forest, and the rows of pillars which characterize Gothic aisles, being imitations of the long avenues of trees which adorned the entrances of noble parks, and country-seats.

The idea that the visible manifestations of God, give us the best possible conception of what his hidden and

spiritual attributes must be, had long since become a fundamental principle, and, in the age in which Gothic architecture had its birth, this idea was an inborn sentiment throughout civilized Europe.

The natural phenomena (wonderful to us in the nineteenth century, but *miraculous* to those who lived in the twelfth;) which are continually manifesting themselves, go far to prove to us the infinity and incomprehensibility of that Power which is the author of them all.

It is therefore quite natural that a people who recognized these sentiments, in aiming at the production of such works as should inspire awe and veneration, should imitate that which they esteemed the highest and most direct exposition of Divinity—Nature.

The earliest example of the fully developed Gothic style is the Cathedral of St. Denis, founded by the Abbé Suger in 1144. Almost contemporary with it are the Cathedrals of Notre Dame de Paris, Rheims, Amiens, Chartres, Beauvais and Bourges, in any of which we may find most of the attractive points which belong to the style to-day.

The invention about the same time of stained glass had a tendency to hasten the development of Gothic architecture, being seized upon by the architects of that epoch as not only highly decorative in itself, but as being more appropriate for paintings than the walls which had been used by the Romanesque architects, for frescoes.

This wrought a great change, for it was found that the small circular-arched windows which had been retained after the introduction of pointed arches in the vaulting, were no longer sufficient to light the churches.

The windows were enlarged by throwing two or three into one, (dividing them only by mullions,) and by making the arches pointed in conformity with the vaulting, thus ensuring a greater uniformity and fitness in the whole work.

The Gothic style appears to have

reached its climax in the thirteenth century, and may be said to have received no improvements since.

Says a writer upon the subject—more particularly of the French Gothic style:

"It is in the cathedrals of the twelfth and thirteenth centuries . . . that we find the noblest development of the Gothic style.

"Everything tended to make them so. The nation was united in the effort—all the science, all the arts, all the learning of the times was centered in the church. In it, and that almost exclusively, the sculptor, the painter, the historian, the moralist and the divine, all found scope for the expression of their ideas on the sculptured walls, porches and niches, or the painted windows of the cathedrals—the churches of the people."

Religious sentiment of the most elevated character found its best exponent in the Gothic cathedrals of those times. The attempt of the Greeks to leave the impress of their faith upon their architecture was entirely successful, and in their structures we read the history of a beautiful mythology,—a scheme of divinity which, though founded on principles of unenlightened heathenism, was full of a certain awe-inspiring beauty; but when we turn to the contemplation of a Gothic cathedral we comprehend at a glance that it belongs to another epoch,—that it has been built by the light of a noble religious era. A divine inspiration has here manifested itself, and touched the whole work with a radiance which lifts it far above the loftiest aspirations of Grecian paganism.

The architectural works which precede, and those which follow, the Christian era, form two utterly distinct pages of history,—two pages which, while they are alike instructive, lead the mind into widely divergent channels and enunciate, one the blind adoration of the Pagan,—the other the enlightened faith of the Christian.

But enough, for the present, of these

reflections; we cannot pause longer over them, nor stop to ponder the innumerable and prolific suggestions which they evoke, but must pass on to the consideration of other branches of the subject in hand.

We deem it scarcely necessary to enter at any length upon the subject of *Climate* as an architectural influence. The dullest mind contains sufficient capacity of reflection to comprehend the absolute control which the temperature and atmospheric peculiarities of a country or section must exert upon its edifices.

Those edifices, whether intended for residence, worship, business or amusement, or built with a view to more external adornment, must conform to the requirements of the climate of the region in which they stand.

The Hottentot beneath his frail shelter of palm, possesses a house which, in some respects, compares favorably with the most elaborate conceptions of cultured Greece or powerful Rome. In its quality of originality we must assuredly "award it the palm," over styles which many cynics of the present day deem only imported copies of Egyptian and other ideas; and besides being pre-eminently suited to the climate, it has many admirable points and characteristics, albeit substantiality is not one of them.

The Esquimaux makes himself equally comfortable in his cabin of ice-blocks, which, though possessing (when in the region of the North Pole) that last named quality in which the Hottentot's shelter is so deficient, would disappear quite as rapidly under an Indian sun, as would the palm hut in an Arctic storm.

This climatic influence, of which we have cited the extreme examples, is felt at every latitude to an extent precisely proportionate to the distance of that parallel of latitude from the equator or the pole, being varied, of course, by the atmospheric and other differences of longitude.

If, therefore, these assertions are acknowledged facts, no argument to prove them is required, and the subject need only be introduced because, from its paramount importance, it cannot well be omitted.

Government, likewise, so manifestly affects all the manners, habits and tastes of the governed, as scarcely to leave any ground for argument with regard to its influence upon Architectural Style, yet we think few persons realize the extent to which this influence is carried, and the *direct* bearing it has upon the external evidences of a nation's taste, as exhibited in its buildings. What is called *creative genius*, may here be said to cease to be creative, the result of it being but a direct reflection of the primary cause or causes. Doubtless—in cases where in-born religious sentiment comes in contact with the influence of the “powers that be,”—the precedency must be given to the first-named cause; but it will usually be found that these influences are co-ordinate, the tendency of both being towards the same general style, and the workings of the two being in harmonious accord.

In the feudal days of England the government, or rather governments, (for the feudal system was but a series of vassalages, subject, by the laws of rank, to a centralization of power in case of national peril,) afforded so little protection to the masses of the people that they were obliged to look for protection entirely to their immediate lord, whose castle became their fortress, and whose walls shielded them in return for their services in defending the same from the assaults of the common enemy.

The Barons were therefore obliged to erect castles which should answer the requirements of residences in times of peace, and of fortresses in times of feud, (we cannot call these petty quarrels war,) and in doing so created a style which, although deriving its origin from

necessity, and having utility for its primary object, is by no means devoid of a certain grand beauty.

Had it been possible for William of Normandy to have established a constitutional government, or even an absolute monarchy founded on principles of equal protection, the relation of lord and vassal would never have existed, and as a consequence, the Norman castle have had no place in the history of England.

Greater results, however, than the existence of these castles have flowed from less important causes than the conquest of England, and such a reflection is only valuable as proving the matter under discussion.

The Anglo-Norman style differs materially from the original order first used in Normandy, the differences being modifications produced by an admixture with Saxon tastes, customs and ideas. In both Anglo-Norman and French-Norman, the masonry and general workmanship is rough, corresponding exactly with the prevailing manners and government of the times. The aim of the architect seems here to have been the production of an edifice which should win admiration by a *coup d'œil*, and carry the beholder by assault. The first impression of grand massiveness, which a Norman pile gives, is sufficient to overbalance such unfavorable impressions as are produced by the imperfections made manifest upon a close examination. Like the greatest paintings of many of the old masters, the details, taken singly, are poor, and, in many cases, lack uniformity of size and design, yet in the whole we have a noble specimen of magnificent general effect.

The chapel in the White Tower of the Tower of London is the best specimen of the pure Norman style in England, as well as the earliest example of its use.

The edifices of Canterbury, Dunfermline and Durham, while they possess many fine points, are not nearly so pure in their style, and give evidence

of a liberal admixture of the Saxon element in their composition.

The Anglo-Norman is in a great measure the type of English Government after the conquest, and, in its variations from the French Norman, is a forcible demonstration of the analogy which exists between government as a science, and architecture as an art. Indeed, a search after the origin of architecture will be found to be only a search after that of government, for if we go far enough back to discover the first signs of attempts at architectural works, we will find ourselves at the era of the first efforts at government.

During the early years of the world's history, each man lived *to himself*, *by himself*, and *for himself*; there was no effort to form communities, no combination having common interest or looking to the end of mutual protection. Each man governed himself in his own way, and as these ways were entirely subject to whim or fancy, there was consequently no government at all. At this stage, architecture had not been born. Man lived literally *upon the face of the earth*, ate the natural fruits of the earth, and sheltered himself from the elements in such cavities and clefts as nature afforded. Being ignorant of the art of governing, he was ignorant of that of building. One step further, and we see the first rude effort at the formation of communities, (and consequently of governments,) and at the same time the first result of a conception of Architecture becomes visible.

The early Nomadic tribes, wandering from place to place, without a home, had still their huts, temporary and weak, yet, nevertheless, artificial, being the result of something outside of simple nature and independent of its formations.

That light which induced the conception of the advantage of a union of interests under the government of a tribe, served to illuminate the same minds with the idea of the necessity for a

means of protection from the elements, and thus were born these twin children—Government and Architecture, which were destined to be the great progenitors of the civilization of coming ages.

In the first stage, Architecture presents itself as entirely utilitarian. No attempt was made at anything above utility and only the primary steps attained in that, but, in the next era, we not only see great advancement in the production of works of usefulness, but discern the glimmering of the dawn of taste; an effort,—slight as yet, but containing the genius of future success, to add something to the mere necessities of shelter and abode. At the same point we discover that we have reached a second era in government. An idea of justice has crept into the expanding minds of men. Government, simply as a means of *control*, is here not up to their requirements. A desire to reward virtue and punish crime in the due proportions of right and wrong, has manifested itself, and consequently a nearer approach has been made to civilization. Another step and we behold the successful attempt to embody thought and sentiment in such adornments as the age has discovered, and the equally successful effort to perpetuate these and render them palpable to future generations. Here again we have reached the period when men, comprehending the necessity for yielding to the *public good*, submit themselves to the ruling of their fellows, and suffer such penalties as, in the opinion of their countrymen, their offences merit.

The next age opens to us the glory of that genius which finds its best exemplification in the Architecture of Greece and Rome. Here civilization seemed to have reached its climacteric. It was at that stage when it appeared doubtful whether it could be carried farther, and whether, for want of some higher sphere to conquer, it would not fall. This fear seemed to meet with a realization when

Rome was overrun by the barbarians; but the tide of Empire had only surged Westward, and Western Europe, passing through the same architectural and governmental stages, as had Greece and Rome, produced anon the same results.

At this point, Architecture, while retaining all the utilitarian, and perfecting its artistic qualities, had begun to exhibit itself from a *Scientific* point of view.

Its constructions were based upon the theoretical knowledge of certain physical laws, and the ability of rendering those theories practical, and were therefore a branch of *Mechanics*.

Architecture as a fine art occupies today no higher place than it did during the times of Michael Angelo, yet it has advanced greatly as one of the useful Sciences, and in its adaptation to the needs and comforts of mankind has kept pace with most, and outstripped many contemporary Sciences.

Here, again, its analogy with the art of Government is visible, for while the

aim of the architect of to-day seems to be the preservation of the artistic elements in *subservience* to the requirements of utility, that of the political economist is evidently towards a Government, which, although dropping the external pomp of ancient times, shall retain the dignity of which that pomp was the badge, and be rendered equitable by being founded upon the will of the people.

But although analogous, the two sciences cannot be said to go hand and hand, because they stand towards each other in the relationship of cause and effect.

Architectural style is, indeed, but the effect of a series of causes, an examination of whose influence upon its developments would afford material for a volume. It is the outgrowth of religious sentiment, the necessary result of climatic peculiarities and the type of government; its characteristics being modified by a hundred causes, each of which is, in its way, a potential influence.

OLEOGRAPHY.

THE patterns which the Manufacturers of Paper-Hangings have used, from the earliest time of that art, were put upon wood-blocks; and the designs, themselves, have been derived from the endless transformations of the Kaleidoscope.

Numerous and beautiful were the devices produced, from time to time, in the progress of this most useful of the ornamental accessories of domestic architecture. But, science is not satisfied. In fact, she never is, so long as there remains the slightest glimmer of a chance for another idea; and here we have one more instance of the truth of this observation, in the recent process for the utilization of cohesion figures. This interesting subject has been taken up by Dr. Moffat, of Glasgow, Scotland, and clearly shows that the well-known fact,

of most kinds of oil, when poured on water, spreading over its surface, and sooner or later breaking into variegated patterns, which are often of very great beauty, and in this fact is likewise comprehended the greatest variety of forms or configurations. The scientific experiments of Dr. Moffat go to show, he tell us, that, from the construction of the oil film, we can determine the kind of oil examined, as also its genuineness. A drop of pure sperm oil, let fall on a vessel of water, quickly expands to several inches diameter, breaking up on the edge into numerous small holes. Sixty seconds is the time allowed, for such action, in the case of pure sperm oil. The centre of the patch is also found to have a great number of holes smaller than those on the edge. In two minutes' time the small holes begin to

enlarge, continuing to do so for about thirty minutes, when the oil is broken up and detached. The doctor truly remarks, that there is value attached to this simple test.

Green rape oil breaks up more slowly than sperm, but, after sixty seconds, its pattern is different, the circles being large and beautifully defined. Purified rape oil becomes much larger, in the pattern circles, than green rape, in the same time.

"Lucca olive oil" gives a large representation in one minute; in two minutes an extraordinary development; and, in three minutes, a very large "likeness." What the doctor means, by the expression "likeness," we really cannot divine, for he does not say of what it is a likeness.

Green olive oil gives but a small pattern in one minute, and differs from the Lucca.

Seal and Castor oils give forms, which are very small.

Dr. Moffat remarks, that, in making these observations, it is necessary to attend to the size of the drop of oil, the height it falls, the force with which it does so, and the perfect purity of the cold water, as well as its stillness, at the time of dropping the oil on it.

The experiments are conducted in the following manner:—"From a small dry burette, drawn out to a fine point, filled up to a certain mark with the oil, cautiously let fall a single drop, at four inches height, upon the centre of the water contained in a common soup-plate, or glass basin. We shall assume that Lucca olive is taken. The drop should, at once, spread circularly, about four inches, on the water. If it does not do so at once, then the plate, or the water, is not clean; and the water is to be poured out, the plate be well washed, and again filled. All rubbing with towels is to be avoided. At thirty seconds, the appearance of the representation is very lovely, having all the similitude of crochet work."

This beautiful mode of producing patterns, of exquisite beauty, owes its origin to Charles Tomlinson, an Englishman; inventor of what are called *Cohesion Figures*, which are produced, as we have seen, by the forms assumed by various oils, dropped on water. These, though so admirable, were practically useless, until Dr. Moffat discovered the method of transferring them to paper, with all their brightness of color, in perfect permanency. It is but to lay a piece of glazed surface paper on the pattern, for a moment; remove and wash off the excess of ink, with water; and your pattern is there, complete.

The marbling of paper used by bookbinders is produced by the dropping of indiscriminate blotches of pigment, of various colors, on water; and taking them up, on paper. This operation, however productive of brilliant effects, is coarse, in comparison with that we now call attention to, which no doubt, in the hands of our ingenious artists and artisans, will confer very desirable advantages on the ornamental department of Architecture.

O.—Mica is abundant in the United States. In some parts of Siberia it is still copiously quarried in large plates, and is employed as a substitute for window glass. It is also used for panes in the cabin-sashes of Russian and other men-of-war; being perfectly exempt from breaking, through the concussion of broadsides.

CONCRETE—The use of this composition is coming more into notice than ever; and the study of it cannot be too closely attended to. The reason of walls not being built of it oftener is the want of a perfect knowledge of the mode of making and putting it into moulds, in an economical manner, at the same time ensuring its greatest amount of hardness.

LANDSCAPE, DECORATIVE, AND ECONOMIC GARDENING.

No. 6.

THE NECESSITY AND UTILITY OF PLANS.

THE locality and position having been selected, the next progressive step is to have prepared a well-defined working-plan of the entire improvements. This is equally indispensable, whether the place be large or small, indeed, if the absence of a plan, in either case, admits of palliation, it is in the case of the former; because, when all the parts are limited, and contracted as to scale, it is the more difficult to create and preserve distinct expressions, and economize, so to speak, every foot of the design. To strike out the outlines of an arrangement, for the various accompaniments and conveniences of a country residence, requires a mind not only thoroughly imbued with the principles of taste, but also conversant with the applications of art to the development of beauty. The subject allows, in all its varied details, the exercise of the most cultivated insight; and demands practical acquirements that can only be obtained by long study and experience. Yet it is notorious, that most people consider themselves qualified to lay out their own grounds. They may not have given the matter much thought, but whatever they have given it, has enabled them to arrive at the conclusion, that they will want but little, in the way of improvements, and that little they can accomplish themselves. In house-building, although they will undoubtedly have certain peculiarities of arrangement, that they wish to secure, yet few persons are so blind to their own interests, as not to submit the whole to the discretionary approval and supervision of a competent architect. Admitting, that every one knows best, what will meet his ideas of comfort and convenience, in the abstract, there are but few who can carry them into execu-

tion; or satisfactorily introduce and fit all the disjointed parts, so as to produce a complete and perfect whole.

A little well-directed observation of rural improvements, will afford convincing proof of the truth of these remarks. In suburban districts, especially, we are constantly reminded, that the majority of those, who undertake the improvement of their own grounds, spend a great amount of money, in leveling, grading, building terraces and making roads; doing and undoing, without any permanently useful result. Laborers are engaged; and much demonstration of energetic toil and zealous perseverance, is continued, until the fact becomes apparent, that all changes are not improvements; and that, of all operations, the most expensive and least satisfactory is that of promiscuously removing and replacing soil. So the work is either abandoned, in disgust, or they conclude to do, what they ought to have done at first, consult with some competent landscape-gardener; and get him to prepare a proper working plan.

I am well aware, that it is a custom with those who wish to be considered amateurs in this line, and busy themselves in advising their neighbors in regard to building and planting, to decry all necessity for plans, and sneer at them, as being beneath the dignity of an artist. Even some *professionals*, who have not the ability to foresee the *rationale* of their operations, pride themselves upon their incompetency, considering it a proof of superior skill, that they "can carry their plans in their heads." I have frequently been brought in contact with individuals of this class, with a view to getting an explanation of their ultimate intentions; but, almost

invariably found, that their strong predilection, not only for carrying plans in their heads, but also for keeping them there, was too great to be overcome.

There is another class of advisors, who seldom lack persistence; and are very troublesome, in their way. These have some specialty, that you either must, or must not adopt. "You must not have a straight walk on your grounds;" or, "You must have a circle, with a fountain in its centre, in front of the house." You must have a piazza all round your house;" or, "Your front steps are too wide," &c. There is no absurdity, that they may not recommend, and no beauty, that they may not denounce. Dean Swift, in the following letter to a friend, gives a good illustration of this class of counsellors:

"That this letter may be all of a piece, I'll fill the rest with an account of a consultation, lately held in my neighborhood, about designing a princely garden. Several critics were of several opinions. One declared he would not have too much art in it; for my notion, (said he,) of gardening is, that it is only sweeping nature. Another told them that gravel walks were not of good taste, for all the finest abroad were of loose sand. A third advised, peremptorily, that there should not be one lime tree in the whole plantation. A fourth made the same exclusive clause extend to horsechestnuts, which he affirmed not to be trees, but weeds. Elms were condemned by a fifth; and thus about half the trees were proscribed, contrary to the paradise of God's own planting, which is expressly said to be planted with *all trees*. There were some, who could not bear evergreens; and called them nevergreens: some who were angry at them, only when cut into shapes; and gave the modern gardeners the name of ever-green tailors: some, who had no dislike to cones and cubes; but would have them cut in forest trees: and some who were in a passion against anything in

shape, even against clipped hedges, which they called green walls. These are our men of taste, who pretend to prove it, by tasting little or nothing. Sure such a taste is like such a stomach, not a good one; but a weak one.

"I have lately been with my Lord —, who is a zealous, yet a charitable planter; and has so bad a taste, as to like all that is good."

Before a plan can be made, it will, of course, be necessary for the designer, either to visit the property, or be furnished with such data, as will enable him to attain a clear idea of its condition. A personal visit is always the best, and where the ground is much broken, abounding in irregularities of surface, or partially covered with trees; or, in cases of alterations in old places, it is almost indispensable. The only substitute will be a topographical survey, with the position of every object defined, together with a full description of the surrounding and distant scenery, particular views, the location of leading thoroughfares, character of the soil, and other objects of interest. But no accuracy of survey, or description, will convey so clear a conception, as a personal inspection. There are many incidental matters, liable to be overlooked in the most elaborate descriptions, that may prove of essential importance, which will be taken in at a glance, by those accustomed to anticipate effects. A personal interview with the proprietor will be more likely to insure a plan, in accordance with his wishes, in all particulars. No abstract beauty, in a place, will ever compensate for the absence of those more utilitarian objects, that are considered a necessity, for family comforts or conveniences. Where ladies are interested, their assistance will generally be found of great value, in deciding upon the arrangement of these details. As a rule, it is safe to consider, as an absolute necessity, the average wishes of the family. The manner, as well as extent of improvement

will greatly depend upon the intention, and, to some degree, upon the taste of the proprietor. Certainly no professional artist will feel perfectly satisfied, to hazard his reputation in recommending a plan involving any considerable outlay of money, without visiting the grounds to be improved; and ascertaining some leading points concerning the wishes and expectations of the owner.

The proprietor should impart all the information in his power, relative to his own preconceived designs; and freely answer all questions asked to that purport. It is to his interest that this should be done. The landscape-gardener will not, on the other hand, be unprepared to hear a good deal, that, perhaps, may not appear to bear closely on the subject; but he will thus gain a knowledge of circumstances, that will be of value in assisting him to arrive at conclusions.

Nothing can be more unsatisfactory to the gardener, than to be accompanied over grounds; and find no notice taken of his questions or remarks. This course is sometimes adopted in order first to learn the opinions of the visitor, so that he may not simply coincide with all that is advanced, from a desire to please his employer. This is a mistaken conjecture; and often leads to serious misunderstandings. The gardener, if experienced, will quickly take in the whole drift of affairs, and be equally reticent. He will naturally conclude, that, if the proprietor takes no interest in the matter, there will be but little prospect of appreciation, whatever the result may be; and as he is thus denied, what is to him, the most important information, to enable him to suit his advice to all the conditions of the case, he will certainly feel, if he does not show, an equal indifference.

The position of the main buildings, and the adaptation of their ground-plans, should be determined in consultation with the architect. It is one of the most frequent oversights, to have

the house built, regardless of its relation to levels, as affected by the subsequent improvement of the grounds. I have seen much trouble and expense involved in the endeavor to suit ground lines to the various levels of porches, door-steps, and basement openings, where attention has not been given specially to these particulars; and these results will certainly be experienced, where the ground-plans are decided upon, in the absence of a conference between the architect and the landscape gardener.

The position of stables and all other contemplated structures, having been decided upon, the gardener proceeds to take accurate notes of their outlines and bearings, define positions for vegetable and other gardens, points of entrance, direction of roads and walks, and other prominent objects; securing such data and measurements, as will enable him to mature plans for the entire arrangement.

In submitting his plans—which should be as simple and definite as possible, with but little attempt at mechanical embellishment—he should accompany them with ample references; every tree, and at least all prominent shrubs, being distinctly named, and referred to numbers on the plan. The written explanations should be particularly accurate and minute; and reasons given for everything proposed, both with regard to present, as well as to future effects, also full instructions concerning the relative order in which the operations should be executed, and suggestions for future management. All these memoranda will then prove of more than immediate value, and be useful as references, and in comparisons made at any time thereafter.

It can never be altogether satisfactory, to undertake improvements, until the proprietor sees clearly the objects and intentions of the design; and unless this can be done, it is strong presumptive evidence of defect, either in the plan, or in the explanations.

When the proprietor fully apprehends the nature of the design, although he may not be able to prejudge all the effects to be produced, yet he will have a knowledge of them, sufficient to enable him to understand the purposes of preliminary operations, which, otherwise, he might deem extravagant or unnecessary. It is, moreover, a source of gratification to him, when he can appreciate the gradual development of a plan, for he will then take a greater degree of interest in completing it, as well as in maintaining it intact in the future. He will soon learn to criticize, and take at their proper value, all after suggestions; can decide understandingly, about future additions or alterations, and will have no hesitation in removing, when the time arrives, such plants as have been only temporarily introduced, for purposes of shelter or the production of more massive effects.

The utility of plans depends upon their minuteness and accuracy of details. I have seen very fine, and artistically executed designs, that were of no value whatever, as working plans. Neither is it advisable for landscape gardeners, to furnish imperfect sketches, or allow any such to escape their possession, upon any pretence whatever; for these, even if asked for, and given, simply as a friendly assistance, may prove very injurious to their professional reputations.

In transferring designs, or plans, to the ground, the most correct and speedy method is to divide the plan into squares, by lines drawn on it in both directions, the side of the square being of any convenient length, that will subserve the purposes of accuracy. Squares of sixty feet, for the sides, will be found a convenient length, in ordinary cases. Where there is great intricacy of parts, such as in elaborate designs for flower gardens, squares of thirty or even twenty feet may be necessary.

The ground is to be divided in squares of the same size; and a stout stake set

firmly at each point of intersection of the lines, numbered to correspond with numbers on the plan. A more distinctive method, where numbered stakes are set for other purposes, is to use numbers for one of the lines and letters for the other: each stake will then be marked both by a letter and a number. When the plan and ground are thus prepared, the placing of a tree, a line of road, or any other object, is executed with the greatest facility, there is no possible excuse for making mistakes. It also enables the work to be commenced at any point. Slight practice will enable any one, by looking at the position of a tree, in the square on the plan, to place it in its relative position, in the square on the ground, without the necessity of having recourse to measurements.

A plan carefully prepared, with references, may, in this way, be transferred to the ground by any person capable of reading letters and figures.

When the grounds have much irregularity of surface, furnished with trees or buildings, or any other reasons exist for minute memoranda whence a plan is to be constructed, it will be found of great utility, first to lay off the entire surface in squares, copying the same on the outline map. Notes can then be taken relative to the condition of the grounds, in each square, as exact and precise as may be necessary.

However complete the plan or design may be made, its execution, on the ground, should, if possible, be under the occasional supervision of the author. It is not to be expected, that exigencies are provided for; and, indeed, it is almost impracticable to embody, in any plan of this kind, the numerous details and contingencies, that may arise during its execution, which no one except the author can properly explain or control.

WILLIAM SAUNDERS.

Washington, D. C.

PROPORTIONS FOR WINDOWS.

THE pupil, in an architect's office, who makes his first attempt at designing, is very much puzzled to determine the correct number and proportions of his windows, with a view to external and internal arrangement and effect. Too many there are, not alone pupils but full-blown architects, who pay little heed to the interior, provided the exterior is to their fancy. Hence the frequent blunders, committed in this matter; eventuating in ill-lighted, ill-ventilated rooms. We will make a few observations on this subject, which may be of use in helping the pupil to decide what is most proper to be done. Taking the Italian window as the standard, it and the modern English being much the same, we would first find the cubic contents of the room, and the square-root of that cubic would give us the amount of window-space required.

For example, let the magnitude of a room be given, multiply the length and breadth of the room together, and that product multiply by the height, and the square-root of that sum will be the area, or superficial contents, in feet and inches of the space required. Suppose the room to be forty feet long, thirty feet broad, and sixteen feet high, then $40 \times 30 \times 16 = 19,200$, which product is, in feet, the cubature sought; and the square-root of it, neglecting a small remainder, one hundred and thirty-eight feet, for the aggregate area of the apertures. One hundred and thirty-eight feet will make four windows, of a handsome size and shape, adapted to the apartment in question; and if divided accordingly into four parts, thirty-four feet and a half will be the area of one of them. The area thus obtained when set out for a ground-floor, according to the customary rule, which allows rather more than two squares in height, each window may

be about eight feet eight inches high, by four feet broad.

By the same rule, the dimensions of all the apertures of windows for rooms of any other cubature may be determined.

If the aggregate area of the windows is enlarged, it must be borne in mind that the temperature of the room is reduced in the same proportion; the heat produced in them being so very speedily communicated, through the glass, to the atmosphere without. It is for this reason, that, in Quebec, Montreal, and the northeasterly towns of Canada, as well as in Russia, and other countries subject to great severity of winter, the inhabitants are forced to use double windows. That is, one window within another, the interspace being useful in preventing the escape of warm air, or the entrance of cold into the room. In our northeasterly States, this would be a desirable contrivance.

For sky-lights, lanterns, cupolas, &c., used for lighting stairs, halls, galleries, and the like, this system of double-sashes might be made most effective, in preventing the escape of the warm air, which rises into them.

In computing for the height of window-sills above the floor, it is well to arrange, so that persons sitting may enjoy, with ease, the pleasure of looking out. In our grandsires' days, this was neglected; and the consequence was, that in order to see what was passing, even across the street, one had to stand up; for, the sill was at least three feet high. The introduction of the French sash corrected this nuisance; and the top of the base-board, generally fifteen inches, then became the height above the floor. This was very pleasant in summer, but quite the contrary in winter; for the French sash is ill-adapted to keep out keen frosty wind, or driving rain. So that the architects

of those days saw the necessity for a return to the old lifting sash, but with the improvement of a lowered sill. First, two feet six inches was the standard of reform; and, as innovations, once commenced, will bring on others still, the height of the window-sills went down to twenty inches. This was, of course, for the rooms of the principal floor only. The window-sills of chambers had, of necessity, to be kept high; and therefore did not share in the fashionable reforms of the day. Although it is a practice, with some architects now, to keep down the window-sills of the principal chamber story so low, that the lower shutters have to be kept closed, to counteract the unpleasantness of this arrangement.

The space between the window head and ceiling should be always sufficient, on the principal floor, to admit of a good architrave, &c., as well as to be clear of the cornices of the several rooms.

In the bed-rooms, the window heads will be nearer to the ceiling; but still clear of the cornice.

The French sashes, of which we have spoken, are still very popular in this country; and no doubt present a very pleasing effect, on the exterior. But for interior finish, the difficulty of upholstering, so as to prevent their being altogether inconvenient, is very great indeed. Besides, the mere fact of their opening into the room, is a discomfort, not to speak of the constant liability to glass-breaking, which presents itself. The transom head is, to be sure, a partial remedy against the inconvenience connected with draping such windows, as the sashes are only hinged below that for use, and there is space enough, in the section above the window, to let them open, without interfering with anything, save the hanging curtains at either side.

And here let us warn the young architect against the use of pointed windows, for interior finish. Nothing can be more inconvenient, and, there-

fore, out of place, in ordinary sitting-rooms, than this ecclesiastical feature. If a client is resolved on having them, to make up the appearance of his *priory*, then finish them *square headed on the inside*, filling up the spandril with quatrefoil ornamentation. But, never introduce a fixed mullion; for, however more secure they make the window, they detract very much from its comfort, in diminishing the amount of light admitted into the room, and in affording, but a niggardly chance of leaning out of the window, oftentimes a very desirable privilege.

Casement sashes do not answer a good purpose, in this country; and can never maintain a foot-hold. We should, therefore, use every means, in our power, to improve the lifting-sash, as much as possible; as it certainly has more of the elements of convenience, and positive comfort, than any of its compeers, or rivals, ancient or modern.

The true proportion for the lifting, or English window, is two diameters in height: that is, let each sash be perfectly square. We apply this rule, of course, exclusively to Domestic Architecture. In the designing of windows for public buildings many things must be taken into account, which will go to govern imperatively in this matter.

Both the inside and the outside appearance of a window must be closely studied; the inside with reference to the apartment of which it is a chief feature, the outside in its bearing on the general appearance of the building of which it forms, or is most requisite to form, the character.

An ill-proportioned window is an indelible blot upon an otherwise fine apartment; and likewise may windows designed in bad taste condemn, irretrievably, an otherwise well-proportioned and highly wrought composition of an exterior.

We propose to take up this subject again, when we will go farther into the advisability of styles, as well as the relative proportions of windows.

IMPORTANT TO YOUNG MEN.

THOSE who have entered, or are disposed to enter, on the study of Architecture, should ever bear in mind, that it is not by any means a science to be acquired by intuition. No, that, indeed, would be a very serious error to labor under, and one which our young friends should divest themselves of, without delay. As well might a medical student expect to understand the structure of the human form, or the law student to comprehend the meshes of his future profession, as the beginner in Architecture to see and feel the beauties of his intricate art, without an earnest study of everything bearing in any degree upon it.

Why is it, that so many of our young men, who enter on this study, become nothing more than mere draughtsmen, mere office-machines, working, or rather plodding on, from year to year, in the one senseless round of putting other's ideas, mixed with their own, prettily on paper, scarcely discerning the delicate differences between many of the styles?

How few of our draughtsmen are thoroughly conversant with the philosophy of construction, or the nature of the materials required in such construction?

The answers to these questions are enough to make us feel a sense of humiliation. The fact is, that a sadly large proportion of our young men, who enter architects' offices, are content to draw and letter; and to do these two things well, with perhaps the addition of fancy coloring, is the full extent of their ambition.

Where can be found more intensely interesting *history* than Architecture is, as it were, clothed in, yet how few of these draughtsmen take the trouble to be acquainted with it. They may subscribe to the monthly issues from the press of works, that have much that is

valuable in their pages. But, it is the illustrations, alone, that receive their attention, and these merely to steal an occasional idea from, in order to help out some meagre crotchet of their own.

Do they associate for mutual improvement? Do they seek the library, to take the dusty Vitruvius, or Chambers, from the shelf? Do they strive to master the great subject in hand? Ah, no! The ephemeral tale, that ekes out the school girl's hours of idleness, is most likely to find their sympathy, too; and even this would be desirable in preference to the worse means of spending time, which too many indulge in.

One spirit there may be in an office, even among a crowd of such baneful influences, possessed of courage enough to resist temptation, and energy enough to advance on the track he has chosen. His superiority is no sooner asserted, than it is seen and acknowledged by the head of the office, who, glad to have one on whom he can rely, helps and urges him on, giving him privileges and opportunities, he does not deem it wise to throw away upon the others. This young man bids fair to be more than a mere draughtsman. He will be an architect, and will succeed, too; for, the world is ever ready to be benefited, by the addition to its ranks of just such men.

It would be well for Architecture, in America, if we had more of this stuff, to make our model men from. But, a little empty superciliousness, an affectation of taste, a feeling of envious disliking for the efforts of all but themselves, unfortunately make up the common characteristics of our office youths to-day.

Let us hope for a revival of common sense, and common energy, in the future, more worthy of the American name.

ARCHITECTURE FOR INEBRIATES.

THE Architecture of this country, as related to public institutions, is a subject that is becoming more and more important in the estimation of the people, in proportion as the popular mind is being directed into new and more numerous channels of beneficent effort. In building a city or county jail, or a State penitentiary, the question first, and uppermost in the minds of the authorities, and of the architect, is that of *security*. In erecting an almshouse, security is not so much an object as economy of space. For a college, convenience of internal arrangement, and an imposing, solid exterior, are qualities to be considered.

For the benefit of insane, there are recognized principles of construction and arrangement, which, whether they are the best adapted to the wants of this class or not, are generally adopted.

There is a difference in meaning between an asylum, and a hospital, and yet both these terms are used synonymically. An asylum, properly speaking, is a place of refuge and protection, a custodial establishment. A hospital, properly speaking, is a place for the sick and crippled, a curative establishment. Now, many of our institutions, are of this mixed character, and while those who are in charge of them are content with a classification that is imperfect, architects can do no other than conform to the standard outlines of professional experts, and offer designs in conformity therewith.

There is one phase of philanthropic effort, however, which is indicated by the caption of this article, to which I desire to invite attention. Several States are now contemplating the erection of institutions for inebriates, and architects will be called on to aid in the development of plans for suitable buildings,

hence a few suggestions, may not be out of place.

The class of persons, comprehended in the term inebriates, is a mixed class, not only as relates to social position, education, &c., but as relates to the kind and degree of inebriety. Opium, Hashish, &c., as well as intoxicating beverages, produce inebriation in a great many persons, and in constructing buildings for their recovery, we must take into consideration the wants and tastes of these several classes.

With insane, and imbecile persons, there can be an indiscriminate congregation of classes, with less risk of offending taste, or compromising position, than with those referred to, and hence in providing for the care of inebriates, it is important to guard well every appliance and arrangement, that will in any degree contribute to the self-respect of the inmates. It must be borne in mind that intemperate persons who surrender themselves voluntarily to an institution, for their own benefit, are not supposed to continue in a state of intoxication. They are just such men as we meet with every day in the streets and at the marts of business, and when within the walls of an institution, are as sensitive to all the amenities of life, as they are when sober at home, and in general society. There is no mark of distinction between them and others. When we enter an institution for the blind, deaf, imbecile, or insane, the inmates are marked by their misfortune so that they can be distinguished; but it is not so, with the inmates of an institution for inebriates. They are like other men, seeing, hearing, thinking, rational beings. Their infirmity is hidden; it does not always show itself in the face, gait, manner, or deportment. For this reason, provision should be made for

them in public institutions, with special regard to the preservation of their self-respect, and so far as may be, of their individuality. They should not be herded *en masse*, except on occasions, when in our country all men have a right to congregate privileges.

The church should be a place, where the "rich and poor meet together," and the levelling influence of a universal gospel, may be realized. The public assembly for amusement, or instruction, &c., are all open in the outside world to every ticket-holder of high and low degree, but in social life, congeniality of thought and purpose forms the basis of rational intercourse.

With these thoughts and facts it will not be difficult for any experienced architect to see at a glance, the basis upon which he should commence, in offering designs for institutions for inebriates.

The plan proposed for an institution of this kind in Pennsylvania, contemplates cottages each capable of furnishing lodging rooms and parlor, for from four to eight persons. They should open in the rear upon an enclosed corridor of ample width, and height, leading to a central restaurant, a public library, business office, &c. The corridor should be broken into arches and alcoves, and used as a conservatory and art gallery, or so arranged as to be thrown into a large hall for entertainment, when necessary. The cottages should be separated from thirty to fifty or more feet, and thus light and air from all sides would be secured, and the ordinary domestic methods of heating could be adopted. The restaurant, might be so arranged as to have alcoves, or distinct apartments, for the inmates of the several cottages, or the practice in city restaurants, of having separate tables in a large room, would probably answer as well.

Russian or Turkish baths, are an essential for such an establishment, and could be located in the basement of the corridors, or in a separate building.

Distinct from the main group of

buildings there should be a small infirmary, to which patients should at first be admitted, then examined, classified, and assigned.

A little thought will show the reasonableness and naturalness of this outline. Inebriates generally stray from home. They seek public places, and associations that are hurtful to them.

Their first need as a means of cure, in an institution, is to cultivate the home idea, and be surrounded as far as possible with home-like associations. They need retired places. They should be taught the sanctity of privacy. They should feel the power of cheerful and elevating retirement,—not solitude, or confinement,—but separation from the confused multitude, and seclusion from the bewildering allurements of vice. At the same time they should be within reach of such variety and entertainment, and engage in such industries as are compatible with their taste and profit.

They are sensitive persons, none more so. Their apartments should be liberally furnished, and their self-respect and sense of honor stimulated in every possible way.

The name and surroundings of such an institution, should not be offensive. A place of punishment or confinement they do not need, and will not consent to go to.

The term asylum they do not like, as that implies dependence. Hospital is offensive, because there are hospitals for all loathsome disorders. Home or Retreat are less objectionable. The institution at Media, Pennsylvania, is called a SANITARIUM. It is a "health station" literally, as Cape May, Saratoga, and Bedford, are health stations, and not asylums, hospitals or refuges.

Let Architecture contribute its share toward anticipating the wants of this large class of sufferers in community. Who will sketch a design after the general principles enunciated in this article? Who ever will do so, and give it to the pages of the "Review" will confer a public good.

ON WARMING AND VENTILATION.

WE, of the Middle States of America, have a climate whose temperature has a greater range than perhaps that of any other country. In the summer, the temperature in the sun, frequently reaches near to 150° F., and, in the winter, it falls to 10° below 0° F. In the summer we have it hot, and as the expression goes, "without a breath of air" for weeks; in the winter, furious cold blasts, which would cause an Esquimaux to shiver. Should not our Architecture then be in adaptation to these great extremes?

American Architecture designs great halls, for public use, churches, theatres, dancing saloons, and lecture rooms, which are but little adapted to the climate, and to the comfort and health of the people for whose use they are built.

Architecture, is an Economic, as well as a Fine Art. We, in America, erect a church in the Gothic style, having a roof of vast proportions, the most striking feature of its exterior, and certainly not a beautiful feature. And, in the interior, under this roof, or between its two sloping sides, and reaching far above its walls, we have a *vast, void* space, to be heated in winter, and cooled in summer, (for what, let me ask is more attractive of the heat of the sun, than a great roof.) Is this a style adapted to our climate?

You may mix the Gothic with the Norman, or Lombardic, or the Byzantine; or confuse and confound the Gothic, with any other rude style, it is inappropriate to a modern church in any climate, and not less so, in this climate—we in this age of comfort and luxury, want a church for comfort, and for worship, in accordance with Protestant forms and ceremonies; or if Catholics, with Catholic rites and ceremonies.

An architect should regard the Art Economic as well as the Fine Arts; but with the Gothic, or its combination with other styles of the early and middle ages, neither is regarded. To be sure, buildings of these styles may be heated, and may be ventilated, and may be repaired. But to do so entails an enormous expense. Our climate is more destructive of masonry and roofs, than perhaps any other; and yet our cities are dotted with edifices, on which all sorts of mouldings and irregularities of masonry are placed, to be disintegrated and ruined before the lapse of a century. The ferocious fanatics, the intolerant Puritans of the days of Charles I, tore out of the churches of that day, the chancels and altars, (vestiges of Popery as they declared,) the painted windows, the bells, and all other symbols, placed there, in adaptation to the age when they were built. The clergy were ostracised or killed outright, their places occupied by preachers and exhorters; and the reformation was thus carried forward to receive its death-blow in Quakerism. At this day, all the various religious sects, even to the Methodists and Baptists, are building church edifices of parti-colored stones, and grotesque, (to use a doctor's term) hydrocephalous windows and doors; (big heads and little legs;) with imitation chancels, and imitation altars, and darkened by gaudily painted glass windows, pictures and emblems on the walls, organs, steeples, and bells, in contempt, in gross contempt of the dicta, of these venerated Puritan fathers; and in close imitation of the grand Minsters of Europe, built by those horrid papists of old; even to the candles, lighted to take the place of the sun, shut out by the gaudily painted window glass. This is modern reformation.

But those old Minsters and Gothic

churches of Europe, were built in conformity with the religious forms and usages of Catholic countries. The Catholic cathedrals are open every day for worship. They are furnished with but few seats; for the worshippers, remaining but a few devout minutes, are constantly passing in and out; hence they require but little warmth. Our people, on the contrary at least the Protestant portion of them, enter the churches, and remain seated for hours; and if in Gothic or Byzantine buildings, they suffer dreadfully, either in their pockets or in their bones.

The most commonly adopted method, of heating our public buildings at this day, is by hot air. Now what is more beyond human control than air, in its movements? and as regards ventilation, what so little understood, and in general so ill managed? and what so essential to our health and comfort?

Long dissertations are laid before the public, explaining, or attempting to explain, the theory of ventilation and of respiration, with its exhaustion of oxygen gas from the air, and exhalation of noxious gases, and consequent deterioration of the atmosphere, in a crowded apartment.

We have in some buildings, ventilating shafts or flues built for the purpose of carrying off the foul air. But do not pure air and foul air go out of these flues in company? Certainly they do. Can the skill of man prevent it? Certainly it cannot.

With this system of warming apartments, all the air must be in perpetual motion, fresh air coming in and mixed air going out; and the question arises, whether this movement of air (even warm air) over the persons of those occupying the room being thus heated, and ventilated, is not productive of colds and rheumatisms?

We all know, that air which is stationary, now becomes oppressive; the explanation of this is that remaining dormant in contact with the person it

forms a sort of coating, and air being a bad conductor of heat, prevents the heat of the body from freely escaping. The use of a fan, is a relief, by driving off the heated coating, and supplying fresh air in its place. The air is not cooled by the fan, but changed. This duration of coolness is in part due to the evaporation of the moisture from the surface, caused by the motion, but to a greater extent by the removal of hot air. Thus it is in a room with hot air rushing through it in search of the ventilating shaft, and every one in the room is liable to be affected by it in an injurious manner.

The points to be gained, are: 1st. The introduction of fresh air, heated in such a manner as to be imperceptible to the occupants of the room. 2d. Its introduction in such a manner, that it cannot be vitiated by passing over the persons of those who may be disposed to stand over and around its place of entrance.

The first may be avoided, by introducing the air, not in a current, like a *sirocco*; but so equally diffused that every portion of the space to be ventilated and heated may receive its share.

As to the second point, it is hard to understand, how it is, that so little notice is taken by engineers and architects, of the impurities, disgusting as they are, which are sent flying into our public rooms, from the hot air flues. We have our heaters so arranged, in most cases, so as to supply our apartments with the most pestiferous air, while we at the same time build ventilating flues to carry off this same foul air. Go into the auditoriums of our public buildings, or churches, our court rooms, and lecture rooms; and into most of them, hot air is introduced through large openings, covered by gratings in the floors of the aisles. On a cold day crowds gather on these hot air vestibules. Some spit tobacco juice into them, some scrape off from their boots, the dirty snow; others heat

their filthy *under-garments*, which have not been in the wash tub, perhaps, for weeks, all to be returned into the auditorium, well mixed with the hot volume of *fresh air*; pure and impure, to be inhaled together. This representation, is not in the least exaggerated, and there is no doubt, but that the air is much more vitiated, by these vile habits, than by respiration. It would not be a bad notion to connect wash tubs along with ventilators.

In old times, our apartments were warmed by radiant heat, either from open fires, on the hearth, of wood or coal; or by means of stoves of iron, placed in the rooms.

Radiant heat from iron, is objectionable. The objections, however, are due, not so much, to the hot iron burning the air, but rather to the presence in the iron of arsenic and other impurities.

Arsenic sometimes exists naturally in iron, and its presence in its combination, or mixture, renders iron too brittle for mechanical purposes; hence it often goes to be consumed in the manufacture of various sheet irons. If such iron should be used for stove making, the arsenic is slowly freed from the iron, and escapes as a vapor; going into the apartment with the hot air. Hence the symptoms of fulness of the head, a symptom caused by the inhalation of vapor of arsenic.

Radiant heat, directly from burning fuel, as from an open coal or wood fire, on the hearth, is universally admitted to be the most healthy, and least liable to objection, of a sanitary nature, of any other method of warming and ventilating; certainly for private residences. The great objection is, that, with open fires, we have too great ventilation, caused by the rush of air from the crevices of the windows and doors, to supply the chimney flue. For twenty-five years the writer has enjoyed the warmth of an hickory fire, built on the open hearth, and his experience leads

him to offer suggestions which if adopted will obviate the most objectionable feature of an open fire.

A fire on the hearth, requires a flue of the area of about 160 square inches, for the escape of the smoke, gases, and vapors, resulting from the combustion of wood; along with these, also escapes, a large volume of the air of the room. Of course, as this air goes out up the chimney, its place must be supplied by a corresponding volume: and this in general, enters through the crevices of the doors and windows, and from them over the backs of whomsoever may be between the window and the fireplace. Now this cold air would not be objectionable, or noticed by the occupant of the room, could it be admitted *between his person and the fireplace*.

Any one occupying a room heated by an open fire, during a strong northwest wind, may be relieved of the nuisance of this draft, (which during the prevalence of such a gale is a nuisance,) by opening the door leading to his hall, from whence, instead of cold air, he may have his apartment ventilated with warm air. So too, by constructing under a back of his fireplace, flues communicating between the external atmosphere, and the interior of the apartment; these flues having their openings in *front* of the fireplace, and to its side, a few inches in advance of the fire; the occupant of the apartment, will enjoy the most agreeable warmth of a radiant fire with pure air, sufficient in volume, both for ventilation, and for the chimney flue.

A smoky chimney, may be cured by opening a door or window, thus supplying a quantity of air, equal to the requirements of the fire and flue. The old Franklin fireplace, in common use in Philadelphia fifty years ago, was an open iron hearth, for wood, furnished with hot air flues; which passing around the fire, communicated at one end, with the outside air, and at the other end, with the apartment, *close by the fire*,

thus not only supplying warm air, to the apartment, but, also to the flue. These fireplaces, seldom, if ever smoked, and the occupants of the room, were not troubled with cold backs.

Radiant heat has peculiar properties; one, highly important to health, is, that it passes through the atmosphere without warming it. The atmosphere receives its warmth, from contact with bodies warmer than itself, and not from radiant heat. The rays of the sun, impinging upon solid and liquid bodies, warms them (but not the air) and they give up some of their heat, to the atmosphere in contact with them. Thus, rendering the heated air lighter, it passes up in currents, and is wafted and mixed through and around, with the cooler strata of air having but a moderate temperature. Thus in a room, having in it a open fire, the rays from which passing through the intermediate air, impinge upon our persons, and thus we are warmed,—but not by hot air. In a room heated by a furnace, by hot air, we have but little if any radiant heat. In this last case we inhale hot air into our lungs; in the first case we inhale cold air. Look at the difference, let any one taste hot water of 140° F, or let him inhale hot water of that temperature; try it with a thermometer; and he will suffer a painful ordeal. Yet we, in the hot weather of summer, go out into the rays of the sun with the thermometer at 140° F, without noticing any extra heat in our windpipe or lungs; and why? because, though the thermometer is heated to 140° , the atmosphere is not above 90° or 95° F; and we inhale a comparatively cool air.

This property of radiant heat, is a wise provision for our welfare; but we civilized beings, in this, as in many other of our ways, go in direct violation of nature's laws, and then wonder why our constitutions are broken up. Animal heat, is for the most part, generated

in the lungs, by the act of respiration; the interior of the body, is therefore much warmer than the exterior; and that condition, is its natural equilibrium, and is absolutely essential to the healthy action of the functions of life. Thus, the air not receiving heat directly from radiant heat, is cool on entering the lungs, thus absorbing the heat therein generated, and preventing an abnormal degree of heat in the lungs; not above 98° F; the exterior surface of the body, however, is receiving radiant heat of the temperature of 140° F. I have placed myself in front of an open fire, with a thermometer by my face indicating a temperature of 120° F; and yet my organs of respiration were free from oppression and insensible to an extra degree of heat. In truth the air entering my lungs was perhaps not above 60° F; Let any one raise the temperature of a hot air apartment to 120° F; and it will be intolerable. The lungs could not long endure it. A man may enter a red hot furnace, if the ventilation of air is free, without suffering in respiration.

Heated air too, being expanded, and of greater volume than natural air, affords in respiration less oxygen to the lungs than cool air; hence the dullness of spirits of one occupying a room thus heated; and the scarcity of oxygen in the lungs affords a less quantity of heat in the lungs for the supply of the body, thus causing a sensation of chilliness in one occupying a hot air room.

I have written this long article, because I am sure, that no one can improve on the modes of heating, and ventilation, unless with a knowledge of physics, but that with this knowledge, there will be a return to the old-fashioned methods of heating (improved, doubtless,) by radiant heat. The rays of heat reach in their effects a long, long distance.

A COUNTRYMAN.

April 5th, 1869.

GREEK AND ROMAN DWELLING HOUSES.

IN the following considerations I do not intend entering into any description of the Architecture of Greece and Italy, as exhibited in the numerous splendid remains still extant, and which bear the most indisputable evidence, if any were required, of the very high degree of proficiency to which these two great nations of antiquity had attained in this Art. All that I now purpose doing is to describe as briefly as possible the different modes of construction which were in common use at that remote period, and their application to the everyday uses of life. There can be no doubt that the very earliest structures erected by either of these nations were of the very rudest and most primitive nature—simply lath and plaster. In localities where timber was abundant, log-houses were of common occurrence. As the art of building flourished, and in proportion to the increasing civilization of the age, brick, marble and stone began to be used in building; until finally, those most splendid works of art, the ruins of which challenge the admiration of even our day, bear evidence of a solidity and accuracy of construction in the stone and marble columns and walls which have rarely, if ever been since excelled.

The Cyclopean is the earliest form of masonry in use among the Grecians of which any remains have been discovered; this is distinguished by the walls being formed of huge massive stones, the interstices of which were filled in with smaller stones. Among the most remarkable specimens of this style, the walls of Mycena may be particularly mentioned; in some places, the walls are said to be fully sixty feet thick. There is another form of this style sometimes called the second Cyclopean, which varied from the other by the blocks or stones used being polygonal

in shape, of fully as huge dimensions, and fitted together with the greatest accuracy and precision; but, in neither instance, united by mortar.

Still another mode of construction was facing a rubble wall with square stones, arranged in a wedge-like manner on their angles. This form was united with the more common one of horizontal courses, thus making a kind of a pattern, which produced a very pleasing effect, and which we sometimes see imitated in our times.

A very common way of forming thick walls among the Romans was by facing the outer and inner surface with squared stones, or with brick, filling in the interior with rough broken fragments, thoroughly cemented together by means of the excellent mortar for which they seem to have been famous. For the purpose of binding together the outer and inner face of the walls, large thorough stones were introduced at regular intervals, extending through the whole thickness of the wall.

The temples of Athens, Corinth, and other Greek cities prove that the description of masonry which we call *ashlar* was known to them. The stone or marble blocks, after being quarried, were most accurately worked by the chisel, and made to fit so that the eye could scarcely distinguish the several joints. These blocks were connected with those above them by dovetailing them with those lying side, by side by iron cramps fixed with lead. In one instance, in a marble temple at Cyzicus, the lines of union of those blocks were found to have been covered with gold; and consequently these ancient remains have proved a rich mine for excavators.

The most striking difference between Greek and Roman masonry, as seen from the remains to which we have al-

ready alluded, seems to us to be that whereas the great works of art of the former were mostly of marble and most highly and artistically finished, those of the latter, even some of the more magnificent, were constructed of much rougher and unpolished stone united by mortar, or sometimes of stone and brick in alternate courses. The Romans, however, excelled the Greeks in their perfect knowledge and application of the principle of the arch, with which the latter were unacquainted. We know that a kind of a pointed arch was in use among them, in corridors, but these are only met with in the Cyclopean mode of construction, and were, in all probability, formed, not by building up stones arch-wise, but by cutting out a passage through the solid masonry, after being built up. Indeed there is no word in the Greek language for the word, *arch*. But its very frequent use by the Romans even in walls, where plain masonry would have been sufficient, evinces that among them it was a very favorite and common mode of construction. Some of the most splendid and magnificent remains of Roman Architecture at this day are those of the triumphal arches, built by the different Emperors to commemorate victories. We may merely mention, as examples, those erected by Drusus, Titus Gallicanus, and Constantine, which still are to be seen.

Although it is not pretended that either the Greeks or Romans ever attained to any very high proficiency in either machinery or mechanics, at any rate in no way at all approaching the standard which has been since reached, still it is a matter of history that the more common and simple machines, such as the lever, the capstan, the crane, pulley, &c., were known to them, and used by them as by us for raising or adjusting stones and other similar purposes, in their Architecture.

The famous Trajan's bridge over the Danube is a very striking proof, too, that the Romans had acquired a very con-

siderable skill in the art of Carpentry, as without such they never could have connected, by timber structures, arches so wide as in that bridge.

We will now proceed to give a short description of the general form and appearance of Greek and Roman buildings. We will begin with their dwelling houses, which, in neither case, in external appearance had much pretension to beauty. Being built almost universally on one floor, they were devoid of that elevation or regularity which alone can produce a striking effect on the eye of the observer.

In the Greek house there were two principal divisions, the men's and the women's quarters. The former was entered from the outer door through a narrow passage, and was in form an open quadrangle, surrounded by porticoes, forming a kind of cloister which served for either exercise or meals. Round this quadrangle, behind the porticoes, were ranged the different chambers, dining-rooms, picture-galleries, libraries, bed-rooms, &c., At the end of this quadrangle opposite the front entrance was another door, leading through a narrow passage, into the women's quarter, which also was a quadrangle, three sides of which were surrounded with porticoes, as in the men's; on the fourth, usually fronting south, there was a vestibule, on either side of which were the principal bed-rooms. Behind these were large rooms, in which the women worked at their spinning, weaving or embroidery. The roof was usually flat, on which the inmates could either take exercise or bask in the sun. In some cases, although comparatively very rare, pointed roofs were given.

The use of windows was also extremely rare, and when necessary, such as when looking out into the street, were closed with curtains and shutters.

Among the Greeks, fireplaces and chimneys were altogether unknown, and only came into use by the Romans at a much later period. The Greeks were in the habit of heating their rooms by

portable braziers, in which they burnt wood or charcoal. Some of these were fixed for culinary purposes, and in all cases the smoke was allowed to find its way out as it best could.

A glance at the Roman mansions, in the declining days of the Republic under the Emperors, shows us a scene of splendor, magnificence and lavish costliness which even in our day of civilization and refinement can hardly be surpassed, nay even equalled. The conquest of the world had brought to their doors all the arts that minister to the luxury of man, and the rough thatched or tiled cottages with sun-dried brick walls, earth or rough stone floors, from whence the Romans had issued when they started on their career of conquest, had given way to splendid palaces in the city, elegant villas, adorned with every art that wealth could procure or fancy could suggest. To give some idea of the lavish splendor and wealth which characterized this age of Roman Architecture, I may here state that the house of Publius Claudius cost £131,000; and one of the Scauri owned a villa, which with its furniture, decorations and works of art, articles of *vertu* costly statues and paintings, Babylonian tapestries, &c., was valued at the vast sum of £885,000.

I cannot help here giving a very brief description of a Roman house of the higher order. Before the door was an open space—the vestibule, open towards the road, but enclosed on the other three sides by the outer walls of the house. The outer door was of striking height, surmounted by a very elegant cornice; the door posts inlaid with rich ivory, tortoise shell, or some other costly material.

The door itself was sometimes constructed of precious woods, marble, or bronze, and turned upon pivots, either working in sockets in the sill and lintel, or encircled by metal rings; metal hinges being never employed. The exterior of the house was frequently faced with marble, but from the lowness of the elevation, was devoid of effect from without,

which, however, was amply compensated for by the luxury within. The floors were not boarded, but formed in wealthy mansions of marble, white, black, or colored, forming a pattern. These tessellated pavements are frequently met with, and evince a very high degree of skill and art in their construction and arrangement. The reader will be able perhaps to form some idea of this when we state that so minute are the fragments composing these fine mosaic remains, fragments of glass, earthenware, marble, and even precious stones, as agate and onyx, that one hundred and fifty have been counted on one square inch of surface. The walls were often overlaid with costly marbles, and these marbles again were as often covered with paintings by the most famous artists, or in panels, either in fresco, distemper, or encaustic, in the most brilliant colors. The most elaborate mouldings, cornices, &c., were employed in the interior decorations; and the ceilings formed of polished beams, arrayed in panels and decorated.

The Romans, it may be remarked, were in the habit of heating their houses with hot air, conveyed to the various chambers by pipes, the hot air being obtained from a furnace, which also heated the water for the baths. At this time, in Rome and Northern Italy, chimneys were everywhere used in dwelling houses, baths and bake-houses.

It would take up too much space, and make this sketch perhaps too tedious, to give any lengthened description of the interior arrangement of one of these Roman palaces. Suffice it to say that the private withdrawing rooms, bedrooms, baths, terraces, libraries, porticoes for air and exercise, cool summer-rooms, fronting north, and opening into ornamented gardens with rows of trees clipped into all kinds of the most fantastic and grotesque shapes, all complete a scene replete with the highest degree of comfort and luxury, and denote the most refined taste.

OPEN COMPETITION.

NOTWITHSTANDING the effort made to put the subject of limited or unlimited competition sensibly before the eyes of the powers that be, in this City of Philadelphia, in the matter of procuring designs for the proposed Municipal Buildings, it is evident that open competition is to be the order of things. The Commissioners to whom was entrusted the office of procuring the required design, having well considered the course to be taken, gave to the Councils their decided opinion in favor of a limited competition; in other words, they proposed to have a few of the most eminent architects of Philadelphia chosen to compete for the design according to which the proposed Public Buildings were to be erected. The Councils negatived the proposition of the Board of Commissioners, and thus the competition is thrown open to all who may choose to ventilate their crude ideas, and a free passage opened to the political lobbyists who will, no doubt in due time, crowd in, as usual, to force their favorite party man upon the Commissioners, and, failing them, to urge his "claims" upon the Councils.

The Board of Commissioners adopted the following preamble and resolutions, which tell the story very distinctly:

Whereas, The ordinance enacted by the Select and Common Councils of the City of Philadelphia, and approved by the Mayor, on the 31st of December, 1868, entitled "An ordinance to provide for the erection of public buildings," renders it obligatory upon the Commissioners appointed by the said ordinance "to advertise in at least two daily newspapers published in the said city for three weeks, for plans and estimates of cost of the proposed buildings;" and

Whereas, We, the Board of Commissioners aforesaid, being of the opinion that the issuing of a general advertisement for plans would not be the best

course to pursue to insure satisfactory results, requested the City Councils to enact a supplemental ordinance, leaving the Commission free to obtain plans and designs in such manner as they may deem most advantageous to the public interest; and

Whereas, In pursuance of the aforesaid request, a supplemental ordinance having for its object a change in the manner of procuring plans and designs for the said buildings, was introduced in the City Councils, and after having been considered in both branches of the same, it failed to become a law; therefore

Resolved, That this Commission proceed without delay, to erect the public buildings on Independence Square, as provided for in the aforementioned ordinance of the City Councils, approved December 31, 1868, and amended by a supplement to the same, approved January 18, 1869; and that all the conditions, terms and provisions of the aforesaid original enactment as amended, be faithfully and energetically carried out.

Resolved, That "the Committee on Architecture and Plans" be directed to proceed forthwith, under the original ordinance, "to advertise in at least two daily newspapers published in this city, for three weeks, for plans and estimates of the cost of the proposed buildings."

The very name and high standing of Mr. WALTER, the President of the Commission, ought to have been a sufficient guarantee for the wisdom of the proposed amendment of the ordinance in question, by a supplemental ordinance, leaving the Commission to deal with the matter as they deemed most fit.

That it would have been more advisable, for the public interest, to have yielded to the suggestion of the Commission, discretion might have dictated; but private interests exercised an inner influence, and *alter ipse amicus* appears

to be the motto nearest the heart of our conscript City Fathers.

The question now to be considered is—Will any respectable architect, in good business, hazard the wasting of his time in open competition with all who may choose to try their hand at “designing,” with an eye single to their influence *in another way* to make their effort a success?

We do not think that the determination arrived at is one that is at all calculated to conduce to the best interests of the public in the securing of municipal buildings which, without a ruinous outlay, might prove at once a model of convenience, and a monument of architecturesque beauty.

HORACE GREELEY'S BARN.

“MY barn is a fair success. I placed it on the shelf of my hill, nearest to the upper (east) side of my place, because a barnyard is a manufactory of fertilizers from materials of lesser weight; and it is easier to draw these down hill than up. I built its walls wholly of stones gathered or blasted from the adjacent slope, to the extent of four or five thousand tons, and laid in a box with a thin mortar of (little) lime and (much) sand, filling all the interstices and binding the whole in a solid mass, till my walls are nearly one solid rock, while the roof is of Vermont slate. I drive into three stories—a basement for manures, a stable for animals, and a story above this for hay, while the grain is pitched into the loft or “scaffold” above, from whose floor the roof rises steep to a height of sixteen to eighteen feet. There should have been more windows for light and air; but my barn is convenient, impervious to frost, and I am confident that cattle are wintered in it at a fourth less cost than when they shiver in board shanties, with cracks between the boards

that will admit your hand. No part of our rural economy is more wasteful than the habitual exposure of our animals to pelting, chilling storms, and to intense cold. Building with concrete is still a novelty, and was far more so ten years ago, when I built my barn. I could now build better and cheaper, but I am glad that I need not. I calculate that this barn will be abidingly useful long after I shall have been forgotten; and that, had I chosen to have my name lettered on its front, it would have remained there to honor me as a builder long after it had ceased to have any other significance.”

We extract the foregoing as a testimony of the utility of concrete, by one who is an ardent lover of the useful and the practical, and whose endorsement of the material will exercise a powerful influence in bringing it fairly before the country.

We are sorry that the learned philosopher of the *N. Y. Tribune* did not give us the proportions of lime, sand, and broken stone he used.

DRINKING FOUNTAINS.

We are much pleased to see another of these most welcome springs in the thirsty desert of city life in course of construction outside of Washington Square N. and exactly opposite to Seventh street. Philadelphia has several private and public fountains, and this of which we now speak is still another of such city boons. It is constructed of granite and is apportioned into a drinking place for animals, and also one for citizens, the latter to be furnished with the usual chained cup.

It is a pity that a little more taste could not have been afforded on the design. But it is well to have the blessing, even though it be unadorned. Therefore we feel grateful for what is thus bestowed upon the thirsty, and fervently hope that the tasteful may yet enjoy their share.

NOTICEABLE THINGS.

DRAWING INSTRUMENTS.

TO be a good draughtsman there is nothing so necessary as reliable instruments. No matter how much genius and practical ability in drawing may be the portion of any person, one bad or indifferent instrument will offer opposition to his best efforts, and frequently, if not always, cause them to fail. The manufacture of drawing instruments has improved in proportion to the vast strides which drawing has, of late years made, and the Swiss as well as the French and English makers have been well remunerated for their efforts to produce instruments that would facilitate the labors of the drawing desk. But our American manufacturers, determined to keep pace with the spirit of their nation, struck out for independence even in this—and now we have American instruments which fully equal the best of foreign production, “Philadelphia make” being the test of that which is most desirable.

A good drawing-pen is, like a good razor, rather a chance thing to meet amongst the supply that comes from abroad; but here at home the make is *certain*, and all alike good. We would therefore strongly recommend all our Architects, Engineers, Surveyors and Mechanical draughtsmen, to patronize our home manufactured instruments, if they would secure the best and surest for constant work and unfailing fine finish.

THE CAPITOL EXTENSION.—The decorations of the extended buildings of the capitol at Washington have, since the year 1855, consumed over \$320,000. The report, recently sent in to Congress by the architect, gives the following items: Brumidi, an Italian fresco painter, was paid about \$64,000 for

painting various ceilings with allegorical pictures of gods and goddesses. The American sculptor, Crawford, received \$20,000 for models for the pediment of the north wing, and the models of Justice and History over the doorway to the main entrance of the same; \$3,000 for the statues of Justice and History from the above-mentioned models; \$6,000 for the model of his bronze door, and \$3,000 for the figure of Freedom, in plaster, to surmount the dome. Randolph Rogers received \$8,000 for the model of a bronze door to match Crawford's. The casting of Crawford's door was done by James T. Ames, an American, at a cost of \$50,000; while Roger's door was cast by F. Von Miller, a German, for only \$17,000. Hiram Powers has been paid \$10,000 for a statue of Jefferson, and \$10,000 for one of Franklin, leaving \$5,000 to be expended on other statues, in order to exhaust the appropriation of \$25,000 made in his behalf. Emanuel Leutze has received \$20,000 in part payment for his picture of Emigration, on the wall of the western stairway of the House of Representatives; while Miss C. L. Ransom, of Cleveland, Ohio, has received the comparatively small sum of \$1,000 for her portrait of the Hon. Joshua R. Giddings. The rest of the money, over \$100,000, has been divided among artists of less note, such as marble cutters and bronze casters.

Boston has organized a “New England Mechanics’ and Art Association.” Such should be established in each of our great cities, to aid in drawing forth the latent genius of a very large and, at present, very much neglected portion of our communities. Ex-Governor Bullock of Worcester, Massachusetts, is the first president.

SOLAR VENTILATOR.

There is no more troublesome thing than a smoky chimney and there has been no more difficult matter than the obtaining a perfect cure for, or protection against such a nuisance. Architects and Civil Engineers have, time out of mind, been straining the faculty of invention to overcome this barrier to many an otherwise desirable design. The U. S. Light House Board is well acquainted with the troubles which await on this subject: For, if ever nicety of ventilation, unaccompanied with the slightest fluctuation of flame, was required in anything it is in the lantern of the light-house, where the smoke of the lamp must have perfect freedom of egress, and at the same time all wind being completely excluded, so as to ensure the steadiness of the flame. For now-a-days but one light is used (in the Fresnel apparatus) and hence the danger of its extinction. Numerous, therefore have been the inventions of ventilators to suit the wants of the light-house; and as a matter of course, the requirements of all chimneys. But, one and another have failed to meet the end, and now we chronicle the appearance of a fresh candidate for fame,

The Solar Ventilator is founded on true principles, namely, the expansion by heat of the air in the ventilator, and consequently the production of draft and non-admission of external air. The heating here alluded to is produced by the action of the direct rays of the sun upon a triple circle of glass-lenses, or "burners" two inches in diameter each, placed in the widest part of a metal cone attached to an inverted metal cone on the chimney top. Above the upper cone is a cap, also conical in shape, which oscillates on a ball and socket joint, and when the wind strikes it from one quarter it at once opens a wide aperture opposite for the egress of the smoke, which is assisted in its exit by the power of the passing wind. Whether in blustry or, in steadily-blowing weather

this solar ventilator, as it is called, must act, and, indeed, we cannot see any adverse circumstance save destruction of its parts that can control its action.

Where the ventilator is connected with the chimney flue, a necking is covered by an India-rubber band that effectually cuts off the transmission of any unpleasant noise from the striking of the oscillating cap against the upper cone.

The Architects of Boston and New York are disposed to patronize this new patent ventilator, and we have no doubt but its use will eventually become universal.

WIRE ROPE MANUFACTURE.

Here is one of the most decided improvements on the ideas of our grandfathers that is entitled to attention in our enlightened age. It has ever been the dread of housekeepers, that snapping of a sash-cord, which leaves a window a heavy burden on all connected with it. But this *wire sash cord* at once ensures the most nervous against such accidents. For clothes-lines the *wire rope* must supersede the old hempen arrangement; for it is not alone strong, but everlasting. Dumb-waiters find in it a reliable means of elevating themselves without fear of disconnection. Pictures in costliest frames may hang most favorably from *silvered* cords that look like shining thread of lightest gossamer. And speaking of gossamer reminds us that wire cloth is manufactured by the same company that makes the iron, copper and silvered sash cord, and the other articles we have alluded to. Even lightning-rods are formed of copper-wire so plaited as to be continuous, and therefore not apt to puzzle the electric fluid with a single joint in its free and easy passage to the earth.

In fact this manufacture is as comprehensive as it is useful and curious.

THE NEW YORK POST-OFFICE.

After a long struggle, the site at the lower end of the City Hall Park, New York, has been deemed ineligible and another part at the upper end of that little city breathing space is to be chosen on behalf of the General Government, and an exchange made with the municipal authorities. To this end the Post-master General has appointed Messrs. A. T. STEWART, HORACE GREELEY, and WILLIAM ORTON, a commission, to effect the exchange in question.

If the commissioners will be guided by the good taste and feeling of the citizens, they will no doubt decide on the corner of Chambers street and Broadway, as unquestionably the most fitting location for the new Post-office.

The building could then extend from the former street to a point on a line with the front of the City Hall. By securing such a site there are two advantages gained—First, that that paltry piece of extravagant outlay, the COUNTY COURT-HOUSE, will be kept partly out of sight, though unhappily not out of mind—Secondly, the dirty flank, and the brown stone rear, of the City Hall will no longer trouble the eye of the passenger on Broadway.—Now, here are two great and desirable ends to be gained, and the commissioners, if we do not greatly err in our judgment of them, cannot fail to see it in the same light.

In any case, the relinquishing of the present site at the south end of the City Hall Park is a master stroke of taste and discretion on the part of the General Government, as it will protect the freedom of view which has ever presented itself most pleasingly at the point in question; and the acquirement of the site we most desire would close up, without diminishing, the park grounds, and leave a wide and very available approach for the mail-carriages between the rear of the City Hall and that of the New County Court-house.

NEW OPERA HOUSE FOR NEW YORK.

Mr. S. N. PIKE, the enterprising and tasteful proprietor of two of the finest opera houses in the whole country, the one in Cincinnati, the other in New York, is about to build in that city a third and, rumor says, a still finer one than its charming predecessors.

The site of the present New York one is rather inconvenient, a fault which will be admirably made amends for in the future structure, which is to be erected on Broadway near Fifth avenue, and will occupy the block in which the YOUNG MEN'S CHRISTIAN ASSOCIATION has its present quarters. There certainly could not be a better position in the Empire City than that, and Architecture could scarcely hope for a more advantageous site on which to display her charms to external admiration.

The structure on Eighth avenue affords a lesson which it may be judicious to study in the new design. It is redundant in faults, lacking the very features of Architecture, wanting in taste, and in some parts positively out of proportion.

The prominence of the new Opera House would bring such delinquencies of design into unescapable notoriety, which the backward position of the Eighth avenue building most happily withdraws it from. Let us hope then that the lesson will not be lost, and that New York may have the credit of a really worthy work of architect-uresque art.

From the known liberality of Mr. PIKE, it may be presumed that there will be no restraint of economy laid on the pencil of the professional gentleman who shall have the good fortune to exhibit his knowledge and taste upon this acquisition to the Street Architecture, as well as the places of Public Amusement, in the favored City. There will, therefore, be no excuse for want of elegance of design in the new edifice.

INSTRUCTION FOR STUDENTS.

WE have in preparation a course of gradual instruction for young men who are desirous of improving their time by the study of geometrical drawing, which will shortly be commenced in the REVIEW, and be continued each month, occupying from two to four pages. In these lessons we will endeavor to bring the Art of Drawing, with its accompaniments of shading and coloring, within the comprehension of all; and we trust that the consequence may be a great increase of students of Design throughout the country, not alone in our large cities, where there are means and opportunities, but in places remote from any such, where the young taste, ardent for development, may want the very assistance we now propose to give.

Nor is it the architectural student

alone, or the builder's apprentice, that these lessons are intended for; but for the use also of those who desire to cultivate an acquaintance with ARCHITECTURE—an art so necessary to the civilized world, and one whose works are everywhere to be met with. The vast increase of facilities of travel are making its monuments in every land more known; and therefore the too neglected study of its beauties is now grown to be a necessary requisite of a complete education, and calls for every aid to its development.

THE ARCHITECTURAL REVIEW will do its share in the advancement of the cause, in the hope that its efforts may be productive of a growing desire for that knowledge which every mind imbued with feeling and taste should possess.

FIREPLACE HEATER.

THIS is a new arrangement of the Baltimore fireplace stove which claims the superiority over its rivals, and consequently assumes the title of Champion. It is a very handsome design, and has many excellent improvements. But, in such matters trial is the test, and all who have had experience of the old Baltimore Fireplace Heater and approved of it, will no doubt, extend a welcome to this new aspirant, whose warmth of character ought surely commend it to a corresponding reception by all who believe in the power of improvement. To our readers who are ignorant of the properties of this style of heater we would say that the heat from the room below, in which is the fire, is conveyed by a flue to the fireplace chamber in the room over it, and thus the one fire is made to do the duty

of two fires and the apparatus which transmits the greatest amount of heat with the least annoyance from dust, is unquestionably the best. This Champion Fireplace Heater claims to have these advantages in full, and moreover presents a very bright appearance from the very full view of the fire, which is had through the mica lights occupying nearly the whole front, being a large segment of a circle.

MONUMENT TO HUMBOLDT.—Many of the leading citizens of New York propose to commemorate the hundredth birthday of the great author of the *Cosmos*, by the erection of a monument to him in Central Park, to cost \$2,500. This is a compliment alike worthy of the man and the city.

FIRE-PROOF CONSTRUCTION.

IN the first number of this REVIEW there appeared a full notice of GILBERT'S PATENT IRON ARCHED CEILING for rendering buildings fire-proof in which the name of the proprietor, Mr. J. S. THORN, was omitted, and that of the patentee alone given, thus doing Mr. T. a great injustice, of course unintentionally on our part, and not having been informed of the facts of the case, we could not hitherto correct it. We now hasten to make amends to Mr. THORN, and at the same time to assure him that we regret exceedingly not having known of the matter before.

As regards the system of Iron arches for ceilings, the months which have passed since the article in question appeared have accumulated evidence of the absolute necessity for such safeguards in construction as those of Gilbert's patent. Fire has produced its usual consequences, and the community have been many times aroused to the fearful fact of the inflammable material which constitutes the principal part of the construction of our buildings, especially those occupied as dwellings. The introduction in late years of *iron* for bressumers, tie beams, and in fact as a complete substitute for *timber*, although so general in our new public buildings, should be applied to our dwellings as well. Human life is of too much value to be left without this admirable insurance against fire, and we see no reason why any petty notion of economy should prevent the introduction of this protector into our houses. GILBERT'S patent is a method of corrugated iron ceilings presenting strength combined with comparative lightness, and economy of material, and therefore of cost. It saves plastering, and is susceptible of any and every ornamentation on its surface, which, coated with enamel paint, can be made to present an appearance which the most expensive work in

stucco-plastering must fail to rival. But, above all, and before all, is the grand fact of its being perfectly fire-proof. We have not the slightest hesitancy in commending the Gilbert patent to our readers as prominent amongst the best of the iron constructions of ceilings; and we sincerely hope to see them speedily introduced into the building of our dwellings, as well as our public institutions. It affords us pleasure to know that during the past year large contracts have been made in various parts of the country for this Iron Arched Ceiling. And there is no good reason why it should not come into general use, not alone in public buildings, but also in private houses, where, with the aid of tasteful design, the architect might make it an attractive feature.

ILLUMINATED CLOCKS.—Our London contemporaries are making various propositions for illuminating the public clocks on Church steeples and other buildings, all of which are worthy of at least a thought. One, and decidedly the most to be avoided, is the making gas tubes of the hands, and lighting them up all along in jets. It would be quite as lucid an idea to have the hands of glass cast hollow and filled with phosphorus. The one light would be just as lasting as the other, especially on a windy night whose darkness would make a clock's illuminated information desirable.

FOUND ITS LEVEL.—After over half a century of flirting and coquetting with the winds, from all parts of the compass, the *gilty* old weathercock on the spire of Cuckfield Church, in England, has fallen down. It is well that *vane* things should cease to *a-spire* to the highest positions in the church.

CORRESPONDENCE.

It must be distinctly understood that we do not hold ourselves accountable for the opinions of correspondents.

SIR:—Would you inform me, and through me many another anxious inquirer, as to the course I must pursue to commence and continue the study of design. I have my evenings to myself, and am disposed to make use of them in a profitable manner. By answering, you will very much oblige

A MECHANIC.

MR. EDITOR:—What books would you recommend to one who is desirous of learning Architecture. I mean the principles of the science?

QUERO.

To both these correspondents we would say that it is unfortunately the fact just now, that no public institution of education offers the assistance required, either in books or teachers in any of our cities. It is true that the Cooper Institute in New York, and the Maryland Institute in Baltimore, offer opportunities to beginners in the study of architecture, but the classes are limited as to number, and the great majority as is also the case in Boston and here in Philadelphia, are not disposed to study architecture, but figure and landscape drawing.

We propose to publish a series of progressive lessons in mechanical drawing, architectural design, perspective, shading and coloring, to commence in the next volume of the REVIEW, and will endeavor to make it as fully useful as descriptive teaching will allow.

READING, PENN.,

April 21, 1869.

DEAR SIR:—Will you please let me know in May number of "Review," the "difference between a Bay and an Oriel window?" And oblige

A SUBSCRIBER.

A Bay Window is, practically speak-

ing, a projected window space on the ground floor, having its foundation at the basement.

An Oriel Window is somewhat similar to a Bay, with the exception that it is supported on corbels or brackets, and generally occupies a position on upper floors, and at angles of buildings.

A Bay has two meanings; it is a space added by projection from a room—or, it is the light admitted between the mullions of a window.

An Oriel has but the one meaning, namely a projecting addition, which in the olden time was used in great mansions as a *tete a tete* gallery off of the banqueting hall.

ST. LOUIS, MISSOURI,

March 19, 1869.

SIR:—Please pardon the liberty I am taking in requesting you to inform me what books would be necessary for an apprentice to study to improve himself in the carpenter's trade, and to learn the first principles of Architecture. Hoping I may receive an answer from you, I remain

J—B—.

Nicholson's works are all excellent, but there is much in them that is exclusively English, and now out of date, besides the cost of such works is we fear rather beyond the means of most apprentices.

THE AMERICAN HOUSE CARPENTER by R. G. Hatfield, is a capital work and costs but \$3.50.

MECHANICAL DRAWING by William Minifie, may be had for \$4.00.

But, if our correspondent will drop a line to D. Van Nostrand, 192 Broadway, N. Y., he will receive by mail a catalogue from which he can select. Those we have named are useful works, but there are several others equally so. A

preference should be given to American publications, for, as we have said, there is much in English books that is useless here.

WINCHESTER, VA.,
March 25, 1869.

DEAR SIR:—Believing you to be scientific as well as practical, and being willing to pay for the information, will you please inform me in relation to an idea I have of ventilating. It is to leave openings in the under-side of eaves to let the external air into the spaces between the roof, and finish on the inside; which space will be, in the closest finish, equal to width of rafters and along the sides and top much more: thus giving ample room for horizontal circulation to connect all parts with a flue connected with chimney, or with ventilator in top of roof. This arrangement will cause a draft as the air in said space becomes heated, thus making the attic or upper rooms much more comfortable, and, in case hollow walls are used, there could be a register in walls of *each room*, just below the ceiling, connecting with the hollow space—thus allowing the impure to pass into and up through the hollow space in walls into the hollow space above—thence out at the ventilator or flue; care being had to preserve a good connection. Thus giving a free ventilation to the whole house with but little additional cost.

In extreme cold weather the registers for rooms could be closed, or partly so, to prevent the warm air passing out too readily. I am, respectfully,

G— S—.

Our correspondent has some excellent ideas on the, at present much thought of, subject of ventilation.

The method above alluded to is only applicable for summer use, and serves the purposes of the advantage of a current of air between the ceiling of the upper story and the roof; which of course prevents the usual heating effects of the warm days in summer on the roof,


whatever may be the covering material—tin and slate radiating in the greatest degree.

If properly constructed flues from the several rooms of a house be connected with the air-chamber or duct formed as above stated, and open at or near the ceilings of the other apartments, a thorough draft will be gained, and the air in those apartments will change with a rapidity just in proportion to the degree of heat produced by the sun on the roof. On this the momentum of the current entirely depends.

To admit the external air at the eaves will accomplish no more than to have a tendency to free the ceilings of the upper rooms from the penetrating warmth that would naturally be created by a confined volume of heated air.

For winter ventilation a directly opposite course must be pursued. It is then necessary to expel the cold air from the apartments. To accomplish this with the least expense and trouble it is only necessary to construct separate flues for the purpose, beginning at the bottom of the cellar, say one to each apartment, with a register near the floor. These flues are cold, and the cold air, by its own gravity, will descend in proportion to the volume of warm air, of high temperature, admitted; and the velocity will be greater in proportion to the degree of coldness of the cold air flues thus constructed.

Those cold air flues within the cellar will all be concentrated into one single shaft, to which the gas of the furnace will be admitted. Or, it may be heated by any other means so as to produce the desired effect.

 We are very willing to receive criticisms on design or construction, but we would have it distinctly understood that no personal allusions will be admitted to our pages; neither will we show favor to any communication in which we find an evidence of ungenerous feeling.

QUERIES AND RESPONSES.

CABINET MAKER.—We have seen beds, raised five feet from the floor, to which a flight of steps was a necessary adjunct. We have also seen beds reduced to twenty inches height. And so through all the intermediate grades. As to the dimensions of the bedsteads of former times; they were in accordance with the rank of the owner. The largest bedstead on record is that of the very portly individual known to history under the title of Henry VIII, at Windsor Castle. It was eleven feet square!

R.—You save the space usually given to the hall, by placing the hall-door on the side, sheltered by a porch; moreover you gain side windows for your front parlor.

HISTORIOUS.—It was in the reign of Charles II of England, that windows were first hung with sash-lines.

L.—To illustrate the articles, descriptive of Cathedrals or Minsters, would be very costly, and the engravings would necessarily displace others of more immediate practical value to the great bulk of our readers.

VERO, New York.—We cannot say what the Commissioners having charge of the New Post-office in your city are doing, or are going to do. Time develops all things—even to a new Post-office. In another place we allude to this subject.

MECHANIC.—We would commend you to the *SCIENTIFIC AMERICAN*, the oldest, and far the best publication, for the use of workmen [and, indeed any men, for that matter] which is now published in the Old or New World. Its articles are clear and comprehensive, unburdened with theories worked out in algebra, and intended more for utility than mere display.

BUILDER.—Yes, it is not so easy to detect discrepancies in the *Renaissance*; as in the early classic styles, for the simple reason, that there is a multitude of parts, and great diversity of ornament, in the former; whilst in the latter, the decoration is comparatively so slight, and the members so distinct, and so few, that the eye detects an incongruity with little difficulty.

PERIODICALS.

TREATISE ON THE POWER OF WATER, as applied to drive Flour Mills, and to give motion to Turbines and other Hydrostatic Engines. By JOSEPH GLYNN, F. R. S.

This is the Third edition of one of the most useful of the highly intellectual little books which have for years emanated from Weale's Architectural Library, London. The author is an eminent civil engineer who is ever anxious to benefit the world by his genius and experience, and in the little volume before us he has proved himself a philanthropist, as well as a thoroughly scientific man. There is a great amount of interesting information thoroughly illustrated in its pages, from which we shall occasionally select. This American edition is creditable to its publisher, *D. Van Nostrand, N. Y.*

THE INVENTORS AND MANUFACTURERS' GAZETTE.—This is the title of another aspirant to usefulness and fame, at a still more reduced price than any of its compeers. It is *numberless*, so that we cannot say how long it may have been before the public, and, merely guessing by its terms (one dollar a year) we suppose it to be a monthly. It contains a goodly amount of extracts and a list of patents issued at Washington during the month of February. Published by *Saltiel & Co, New York.*

HOURS AT HOME.—No. 6 has just come to hand; it is full of good reading, instructive and recreative. *Scribner, New York*, publishes it.

THE SCIENTIFIC AMERICAN.—This veteran utilitarian of

mechanical knowledge is still leading the march of mind in our country. Inventive genius owes much to the old "Scientific," and the debt is growing larger each week. Let the interest run on, the readers are willing as long as they mentally thrive under its influence. *Munn & Co., 37 Park Row, New York.*

GOPER'S LADY'S BOOK is one of those evergreens of literature which Time delights in keeping fresh, and the ladies admire the wisdom he displays in so doing.

THE WESTERN MONTHLY.—The April issue, being No. 4 of this Chicago Monthly, speaks well for its prospects of success. Its contents are fresh and varied. The illustration is a finely executed likeness, on steel, of Hon. Anson S. Miller, LL.D., accompanied by an interesting biographical sketch.

THE MANUFACTURER AND BUILDER, NEW YORK.—The April number came out a vast improvement on preceding numbers. The illustrations are numerous and good. The subjects treated are of interest, and made more interesting by their treatment.

THE SCIENTIFIC AMERICAN is evidently not content with its success, but keeps on the advance all the time.

VAN NOSTRAND'S ECLECTIC ENGINEERING MAGAZINE has reached its fourth month, and proves itself to be a highly useful selector and condenser. Engineers wanted just such a work, and will surely sustain it, for its great usefulness in gleanings the very knowledge they need.

THE
ARCHITECTURAL REVIEW
AND
AMERICAN
BUILDERS' JOURNAL.

Vol. I.—Entered according to Act of Congress, in the year 1868, by Samuel Sloan, in the Clerk's Office of the District Court of the United States, in and for the Eastern District of Pennsylvania.

MONTHLY REVIEW.

TO OUR READERS.

IN concluding with the present number, the FIRST VOLUME of THE ARCHITECTURAL REVIEW, we deem it appropriate to the occasion to make some remarks connected with the enterprise which has been undertaken at a hazardous venture, and which has thus far proved to us a very flattering success.

The reason why this publication was begun may be briefly yet distinctly stated in the fact, that Architecture had then no serial literary representative on this side of the Atlantic. Europe had her national publications, and England, especially, was putting forth many monthly and weekly periodicals conducive of the best interests of the great art of construction. Our many-cited country was dependent solely on those foreign publications for such information as might chance to be available to our professional brethren here at home.

But this state of total dependence was not suitable to the rapid growth of Architecture amongst us, nor was it altogether agreeable to the national pride to be thus situated with regard to the passing thoughts and efforts of the age. Realizing this state of things in our own personal experience, we clearly saw the full extent of the want, and came to the determination to establish such a

monthly medium of information and communication of thought as we felt the profession and all connected with it required. Our lead was soon followed by others, whose efforts have been, like our own, to make up for the want hitherto experienced. In the pioneer advance we have made, obstacles were at first numerous, but they gave way before our avowed determination to establish the claim of a national architectural magazine; and now we have the satisfaction to say, that our efforts have been successful, and the most discouraging of our acquaintances have gladly acknowledged the correctness of our calculation on that nationality of feeling which before they feared was but an empty dream.

To those kind and generous friends who stood by us with ready pens and never failing words of good cheer, we tender our heartfelt thanks, for their companionship in the past twelvemonth effort, and give to them an invitation, one and all, to still stand by us in the year to come.

THE ARCHITECTURAL REVIEW is becoming widely known—simply because a publication of the kind was very widely wanted in this country; and we are resolved that no effort shall be lacking on our part to make it meet, as far as in

our power lies, the want it is its chosen office to supply.

In the volume on which we are about to enter, we propose to present additional features. Our rising generation shall have its interests well attended to in the practical as well as theoretical lessons we will give. And this we look upon as the chief plank of the grand platform on which we stand—the education of the young mind in the history, the beauties, and the component parts of ARCHITECTURE.

To our professional brethren, we again hold out the hand of good fellowship, and assure them that our pages are freely

open to them—that their interest is our interest; for, are we not all engaged zealously in the one cause, the propagation of a knowledge of that art which is foremost amongst the requirements and adornments of man's earthly existence.

To all our readers in common we present our thanks for their favor; and beg for its continuance.

That we may make the ARCHITECTURAL REVIEW fully worthy of the patronage we seek, shall be our unremitting effort, aided and strengthened in the future by the experience of the past.

VENTILATION WANTED IN GERMANY.

NEVER, perhaps, has a company of more highly educated and refined people been gathered within the walls of the SING ACADEMY at Berlin, than was assembled there recently to hear the *Passionsmusic* of Bach. All lovers of excellent music, who have travelled abroad, must remember the Hall of the Sing Academy with particular pleasure. In its classic style and decorations it would be difficult to find a single feature which would offend the most critical taste. For acoustic effects its arrangements and proportions are admirable. Not so its ventilation, of which there is absolutely none. The door of entrance is even hung with heavy cloth, lest perchance a feeble draft of air might inconvenience those sitting close by. It matters not from whose lungs the breath may come, (and the boxes opposite me were graced by royalty,) the atmosphere in any room which is occupied by well nigh two thousand persons, becomes very speedily tainted. What can be its condition when there has been no change of air for three hours!

Ought one to have felt disappointed

and surprised when the soprano in singing one of those affecting recitatives in the second part, suddenly sank exhausted in the middle of her performance, and the audience though listening to one of the greatest productions of musical genius, performed in a manner unrivalled elsewhere in the world, looked wearied and anxious to go.

The absolute neglect and ignorance of everything pertaining to ventilation among people in other respects so remarkably learned and clever, strikes me with a daily growing wonder. I have yet to see during a life of more than half a year in Germany the first indication of a crack, crevice, hole, egress, exit, aperture or orifice, which even dimly suggested that the people desired fresh air. When my present landlady discovered that I slept with my windows open, she was loud in her expressions of horror; and a doctor who lived in the vicinity being appealed to, predicted that a persistence in the practice would be attended with serious, if not fatal, consequences. Think of asking an American occupying a respectable position in society, whether

he slept with his window open or not! It would be regarded in the same light as an insinuation of a lack of personal cleanliness. There is one circumstance, however, which serves greatly to mitigate the evils resulting from such tightly closed rooms, and that is the peculiar method of heating which is employed in Germany. Instead of the little sheet iron keg or barrel, in use at home, and in which a fire is kept constantly burning, they employ a huge column or "oven" of glazed earthenware, that rises from the floor almost to the ceiling of the room: An armful of wood is put in the lower portion and burnt as rapidly as possible, the door of the fire-place being left wide open: the oven is then closed, and the landlady tells you that you are "beautifully heated." For the first hour or so, however, you cannot perceive that the making of the fire has made much perceptible difference in the temperature of the room; the full benefit is not realized for three or four hours. But even as many as ten hours after the first building of the fire, the oven will be found to be radiating a small amount of heat.

In this way the room is always provided with a heated flue, the entrance of which is at the level of the floor, and which, as I found by trial, induces a gentle draft for a very long time after the fire has been made.

If there are any places which, more than others, should have the advantage of thorough ventilation, they are those Chemical Laboratories, where a number of young students are crowded together, and where deleterious gases are being constantly evolved. What can be said in this respect of the existing laboratories of Berlin, the present centre of chemical study and science? We shall not say anything of the laboratory of Dr. Sonnenschein, (Privat Docent in the University,) which is filthy, but being an enterprise of a private nature may not be so amenable to public opinion. Nor is that of the School of

Mines (Berg Schule) which occupies the hall of the old Bourse, nor of the old laboratory in the third story of the University building itself, but we shall confine ourselves to the one just completed, and placed under the direction of the famous Dr. Hofman. It is an immense, and when we consider the uses to which it is applied we might say, a superb building. The exterior is adorned with medallions of the great chemists, who have done so much during the past century to increase the knowledge and comforts of the civilized races, and the corridors and grand staircase leading to the auditorium are frescoed in bright and attractive colors. In one room are boilers and retorts and stills for every variety of pharmaceutical manipulation; in another are furnaces for all forms of dry assaying. Still a third is set aside for gas analysis, and a fourth for weighing. There are other great rooms for tyro's in chemistry, and for those more advanced. But in the apartment occupied by experts, a number of men who were making original investigations under the guidance of Dr. Hofman, I found the atmosphere stifling. It was not due to the accidental presence of some noxious gas—that I could have detected immediately—but to an indiscriminate mixture of various smells and vapors, arising from all sorts of preparations, and confined in the room until the air had become thick with them.

Whatever critics may say of this laboratory in other respects (and it was designed to be the most perfect structure of its kind and to afford all the facilities and advantages known to modern chemical science) it is, so far as the physical health and comfort of the students is concerned, an immense failure.

The other evening at the opera of *Fra Diavolo*, where the enchanting LUCCA was performing, after her inimitable way, I occupied a seat in the parquet. The air, which was tolerable for a time, after the conclusion of the first act became, as usual, excessively hot and

bad. Presently a lady, seated near, tumbled from her seat, and being unable, after removal from the house, so I subsequently learned from the newspapers, to give her name or address, she was taken to the public hospital, and suffered from serious illness. If the total neglect of ventilation renders the air so foul in the parquet, what must it be in the amphitheatre? The case is still worse in the theatres and other smaller places of public amusement. So far as the arrangements and decorations are concerned, the *Concert-Haus* is remarkably pleasing as a place of popular resort. On a recent occasion, arriving too late to obtain a seat on the floor, or in the first tier of *logés*, I had to go up to the second. There must have been over two thousand persons present, and a quarter of an hour after the conductor had made the first wave of his baton, the atmosphere became painfully oppressive. I walked around three sides of the room, earnestly but vainly looking for some crevice, where a breath of fresh air might be obtained. At last, knowing what I did of the general prejudice, (it must have been the very infatuation of despair)—I essayed to open the window! There were two men standing near, with the perspiration gathered in beads upon their foreheads. When they realized my intention, they regarded me with such looks as they might have cast upon a man insane, and indignantly asked whether I did not know that a *draft might result*? The first glorious strains of the Heroic Symphony were coming from an orchestra of a hundred performers, and I might never have an opportunity of hearing it as well performed again, but this consideration could not remove my physical misery, and I left the room. I shall not allude to the condition of a tightly closed coupé containing eight passengers, on a cold winter night, nor to a dozen other cases which suggest themselves, in which no provision whatever is made for comfort or health, so

far as a supply of good air is concerned. In this respect the little sleeping-cabinet of the present king, at the palace of Potsdam, is as bad, and probably worse than that of many peasants. One example, in conclusion, will suffice. It is the lecture-room in the University building of Prof. MAGNUS, one of the most noted of living physicists. Some one hundred and fifty students are packed together in a room twenty by thirty feet, around his apparatus-covered lecture-table. The lecturer is demonstrating with the nicest precision the laws which regulate the diffusion, osmose, and transpiration of gases, he certainly cannot be reproached with a lack of theoretical knowledge about these matters, which a recent critic in the *Nation* discovers in the author of a little book that has done untold good at home entitled "*Man's own Breath his Greatest Enemy.*" But as he proceeds in his learned discourse, the window panes grow dim from condensed moisture. In a few moments after the class has assembled, the water is running down the glass in streams, it flows over the sill, until it reaches a gutter, which has been cut to receive it, and then pours down into large cups placed at the side. And this goes on, (the room being entirely closed,) for two hours. I am not describing an exceptional case; for, what is stated above is true, in a still greater degree, of other lecture-rooms in the University, and the arrangements which I have described are common to most houses I have seen. Really, now that it is all written out, it looks as though I were trumping up a case against some Black Hole in Calcutta; or a county jail in the north of England. On the contrary I am speaking of a community which is perhaps without an equal in point of general intelligence and culture. It does amaze me that a people so far advanced in other respects should be so far behind in all that relates to ventilation.

A. R. LEEDS,
BERLIN.

Prof. of Chemistry.

ARCHITECTURE A-LA-MODE.

WE are all more or less desirous for change; and none like to perpetuate anything of our surroundings. Admiration may be carried to the greatest excess when viewing a recently finished structure, but that admiration soon consumes itself, and apathy succeeds it, slowly, but very surely. It is thus that what is termed "Fashion" has its being, and seems undying; for like hereditary monarchy, no sooner does the awaiting herald hear the last respiration of one king, than his trumpet instantly proclaims the name of his successor. It is in like manner that Fashion continues on its endless line, and no sooner does the public eye begin to weary of the one mode, than another is ever ready to displace it. Fashion pursues its course in a circle, of a pretty distinct diameter. In proof of this assertion, it is easy to trace the returning *modes* of past centuries in all the freshness acquired by a long recess of retirement from the constant criticism of the public eye, which grows so much the sharper for the lengthened acquaintance with its object.

ARCHITECTURE was by our fathers deemed exempt from this variation of public opinion, and the staid and well admeasured symmetry of the good old Greek and Roman orders seemed to them to occupy their position in perpetuity. The Gothic style was by many deemed a piece of charlatanism in Architecture, and, instead of its ordinary name, was termed the *grotesque*. But those were the days of slow, methodical thinking, and very different indeed from these days of ours. Then a building commenced was a topic of conversation for some time. Now whole blocks of buildings fail to call forth a remark. Novelty rules the building world, now-a-days, just as much as it does the dressing World of Fashion, why then should

we wonder to see our Architects laboriously culling from long-neglected examples of the frivolous designs of gone-by ages, those features which two dozen years since were so repugnant to what was then considered to be a true taste?

The much lamented Mr. WELBY PUGIN, some twenty years ago, in his lectures on the principles of Pointed or Christian Architecture, speaking of houses built in what was called "the castellated style," then fashionable in England, made the following most truthful remarks:

"What absurdities, what anomalies, what utter contradictions do not the builders of modern castles perpetrate! How many portcullises which will not lower down, and drawbridges which will not draw up! How many loop-holes in turrets so small that the most diminutive sweep could not ascend them! On one side of the house machicolated parapets, embrasures, bastions, and all the show of strong defence, and round the corner of the building a conservatory leading to the principal rooms, through which a whole company of horsemen might penetrate at one smash into the very heart of the mansion! for who would hammer against mailed portals when he could kick his way through the green-house? In such castles we have donjons which are drawing-rooms, watch-towers where the housemaids roost, and a bastion in which the butler cleans his plate!"

All this is caustic and well-merited satire on the state of Architectural design in Great Britain at that day, florid volumes of engravings of which have come to us across the Atlantic, but, all honor to our brethren here who failed to follow the absurdity of the a-la-mode Architecture, which sought to regenerate the feudal reign of the lusty old English barons of the helmet and buckler.

In ecclesiastical Architecture we are more prone to adopt the whims of European resuscitators, and thus are we led to group together numerous small towers that lead to nowhere, and establish heavy buttresses that stoutly bear up nothing, and what with rose windows that illumine only the rough backs of organs, and decorated niches that seem to have been vacated by their saints; not to speak of the very æriel effect of flying buttresses that seem too flighty to be useful; we think we have been sufficiently pliable worshippers at the shrine of fashion to secure for us a modicum of credit in our day from those whose thoughts are *a-la-mode*. But, to return to civil life—Have we not most industriously cultivated the acquaintance of the Middle Ages, because our brethren across the Atlantic have dug up the dust of styles and compositions which Fashion now stamps as “high art,” and which that same Fashion in past ages, would have stamped low into the earth? If we have been derelict in our loyalty to our Greek and Roman

teachers, we certainly cannot be accused of failing to uphold the train of Fashion and follow its attractive folds, even at a respectful distance. Do we not proclaim the ownership of our building by a *monogram*, puzzling to the crowd, but decipherable by a select few—just as in school-boy days we worried with a jack-knife our initials on the frame of our slate. Then we did not dream that the act was fated by the inevitable fiat of Fashion to become a feature of the mediæval revival. Yet so it is, that even our great art, with all its mists of hoary time surrounding its world of a history, is nevertheless as amenable to the ruling nod of the fickle goddess Fashion, as is the youthful miss who has but yesterday made her blushing *debut* on the critical stage of life.

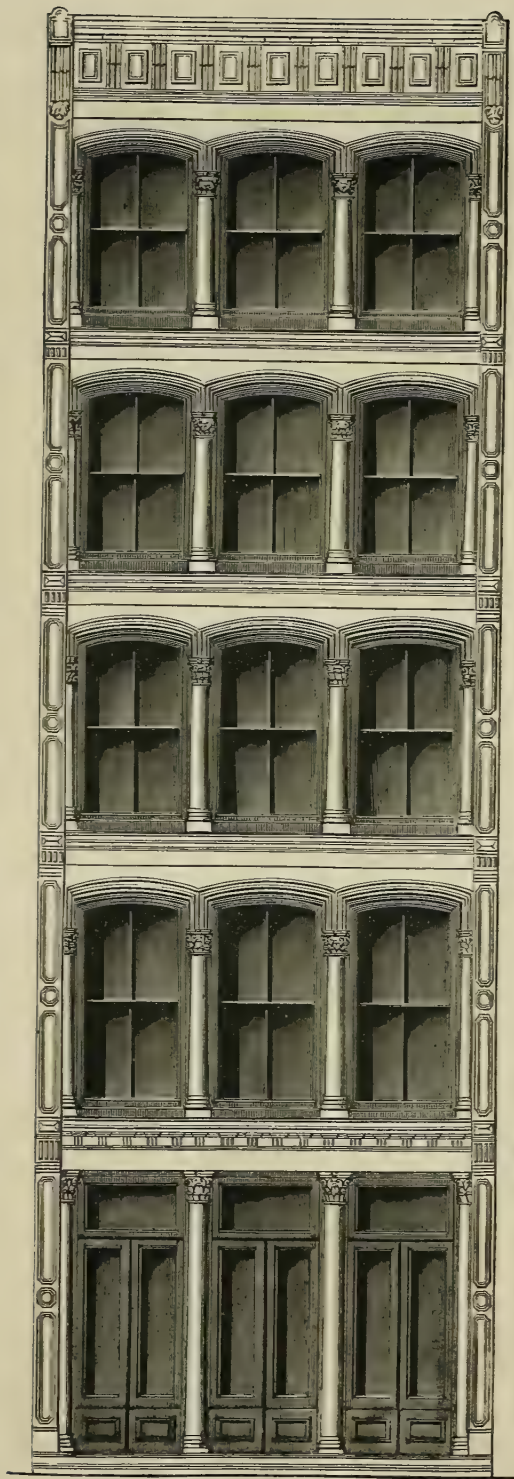
Here, in America, we claim to be a reasoning people, exempt from the tinselled follies of the Continent we fled—but still our manners, dress, and even solid ARCHITECTURE must, if they are anything, be positively A-LA-MODE.

IRON BUILDINGS.—No. 3.

BY WILLIAM J. FRYER, JR., N. Y.

IRON in its architectural application has had much to contend with. Its enemies have ever been bold and emphatic; its friends hesitating and weak. Mistakes occurred in the use of cast-iron from its unskilful disposal, and the material was judged more by the mistakes made by the unskilful, than by its capabilities for proper application. An æsthetic taste gave rein to a false sentiment and openly despised iron as a building material. Constructors in iron took extreme advantage of the ability of cast-iron to resist compression, and of the tensile power of wrought-iron, and in an utilitarian spirit produced spider-like structures suggesting nothing save

economy of space and material. Overloading the surfaces with ornament gave their structures a flashy and vulgar appearance. These early stages have been passed, and taste and utility now go hand in hand. A building should bear the impress of solidity, as though it were indeed a growth of the earth itself, and not of so fragile an appearance that the winds can blow it away. A broad play for light and shadow should be given in every case. Iron affords a cheaper material, a more enduring material, and cleaner and sharper than stone, and it is claimed for it to be the best material, all things considered, for the street architecture of our Ameri-



IRON STORE-FRONTS. No. III.

By WM. J. FRYER, J^r., with MESSRS. J. J. JACKSON & BROS.,
NEW YORK.

can cities. If the ancient examples of cornices and capitals, and mouldings generally, which have stood the test of criticism and been judged correct, are deemed best for stone, then they are best for iron also, and an attempt to inaugurate new styles of architecture should bring a frown as quick when in iron as in stone. But correct outlines must be faithfully followed; and can be in the hands of a skilful manufacturer. If error be committed by the unskilful it no more condemns the material than will the thousands of ludicrous mistakes in wood and stone condemn those materials. The ancients worked in stone and artistically produced outlines that perhaps never can be rivalled. Iron is the modern building material, dug from the bowels of the earth, smelted and purified by an advanced science, and ready to supplant stone, just as history relates, stone supplanted mud in the construction of dwellings for men. Each tells of a growth in knowledge applying a better material.

In this country, where stone and brick are scarce and expensive, and where prejudices are less settled than in older countries, cast-iron building fronts have crept into public favor and confidence more rapidly than elsewhere. In England, slowly but surely, iron fronts are acquiring favor, while on the continent they are further advanced in favor. Much has been said against iron from misconception. It is exceedingly difficult in the minds of most writers who use sweeping denunciations and citations against iron, to separate wrought iron and cast-iron in their respective endurance against weather. Wrought-iron rapidly oxidizes when exposed to the atmosphere and goes to decay. Cast-iron on the contrary slowly oxidizes in damp situations; rust does not scale from it, and the oxidation, when formed, is of a much less dangerous kind than on wrought-iron. A coating of paint will counteract whatever tendency cast-

iron has to rust when exposed. Cast-iron is now entering largely into the construction of bridges in England, on account of its enduring qualities over wrought-iron, which is constantly scaling off with rust.

A great deal has been written about the color to paint iron work. Iron being a material which requires a coating of lead and oil, it is meet and proper to give it any color that good taste may suggest. The color will often be regulated by the character and hue of adjoining buildings or other surroundings. Because marble is white or sand-stone brown, the painting of iron work in these colors must not be prohibited. What is to be condemned is the graining of iron in imitation of marble, and sanding in imitation of stone. Wherever practicable, iron work should be painted inside as well as out. Particular care in this respect should be given to window lintels and sills, so that if rain-water gets in behind and trickles down the face of the building, there will be no streaks of rust to tell of carelessness, or of the entire omission of an inside coating. All iron-work put together in pieces, as cornices, trusses, etc., should have their joints well painted before being bolted or riveted together. In applying ornaments to iron, such as leaves of capitals, etc., not only should the ornaments themselves be first thoroughly painted, but the screws which fasten them to the main work should be dipped in white lead or paint. After drilling a hole in iron the burs around the hole should always be filed away. A lack of care in these little matters often causes the greatest annoyance. For the first coating of iron nothing is superior to oxide of iron mixed with oil, or what is known as metallic paint.

On the manufacturer depends the artistic appearance of an iron building as well as its durability. The material is capable of receiving the sharpest kind of lines. But to secure under-cuttings,

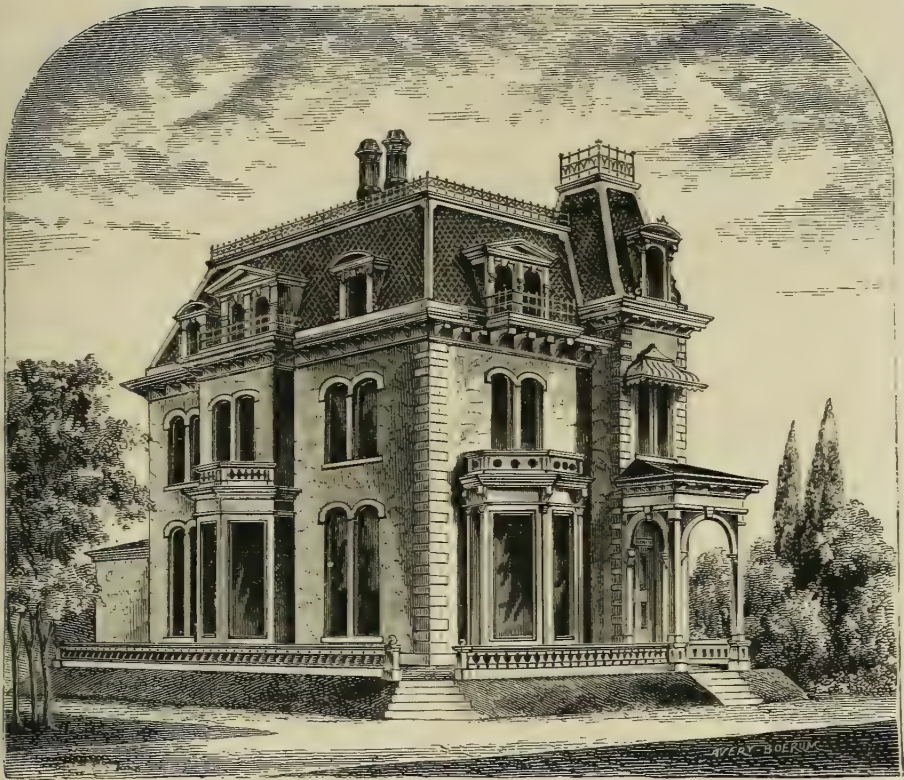
and that certain crispness necessary to the proper effect, particularly of carved work, requires the experienced foundryman in this class of castings. An architectural and a practical education are both essential to guide and direct a creditable execution. Between the iron fronts of to-day and those erected ten years ago, there is a perceptible improvement. The artistic working up of the material is better understood and enlarged ideas of proportion and boldness are displayed. In capitals for example: those first made were strictly in accordance with authorities given in architectural publications. These authorities gave stated heights of columns for their diameters. A twelve inch diameter column should be about ten diameters high, (ten feet.) Practically twelve inch columns for building purposes were required about fifteen feet high. The capitals, however, were made without reference to the stretch in length of the column. By and by it was seen that these capitals were squatty in appearance, like a tall man wearing a low hat. The capitals were then lengthened and in addition a greater projection given. This treatment was followed on bases, and cornices, &c., until now boldness in every part is carefully sought after. Of the present great manufacturers of building iron work, all have executed past contracts which they know reflect no credit, and which they would gladly alter and re-arrange if they could. In these manufactories are thousands of patterns condemned as out of date, and business pride and reputation prevents their use. When architects' scale drawings are furnished, whereby to execute work, full liberty and license is taken to give everything a modern appearance. There is very little disposition evinced to contract outlines for the sake of saving metal, the desire is rather to give the best of their respective kinds.

The prices of stone, in consequence of

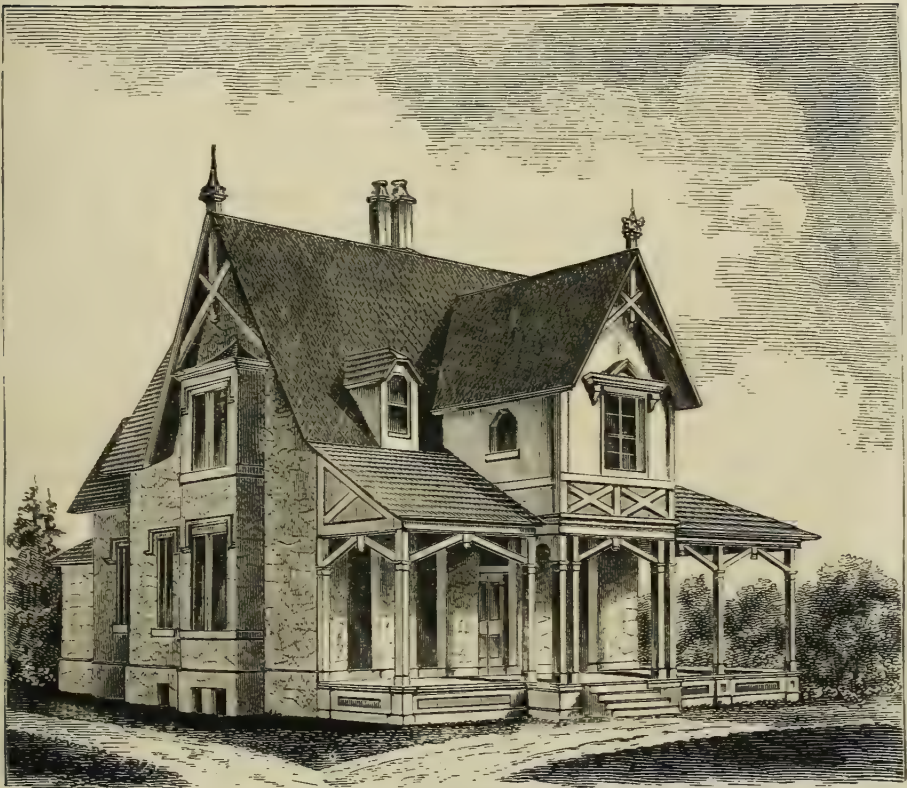
a continuous advance in labor, is doing wonders for iron. In New York there are under contract several entire blocks of dwelling houses with iron ashlar fronts in place of stone. This iron ashlar is a mere shell in rusticated courses, bolted together and anchored to the brick wall, which latter is of the same thickness as in the case of brick backing to stone. The window openings have sills and lintels of a character similar to stone. This kind of treatment in iron costs less than one-half of the same in stone, and is cheaper than Philadelphia pressed brick with moulded stone trimmings, for fronts of houses. For this innovation the eight hour men in part have to answer, but even they cannot stay the progress of iron.

A system of building has been lately brought out which looks to the entire exclusion of brick work. It consists of a series of hollow cast-iron box columns, placed about eighteen feet apart on a line with the depth of the building. On top of the columns, rest wrought-iron cross-girders for sustaining the floor beams. Column over column with girders extend to the height of the structure. Between the columns are horizontal and vertical bars, on which are bolted cast-iron plates of such a character as to receive and retain the plaster which is spread directly upon them. These iron walls occupy far less space than brick, are economical in construction, incombustible, and able to resist an earthquake shock.

The use of iron in buildings has increased enormously within the past few years, and that it will increase in a greater ratio in the coming years, there can be no doubt. New ideas will push the work on in the march of improvement, from its present stand-point. The uses and requirements and values of buildings are changing every day, and iron in its architectural application is to fulfil future requirements, such as in the past it has but limitedly supplied.



SUBURBAN VILLA IN THE FRENCH STYLE.



A MODEL COTTAGE.

DESCRIPTIONS.

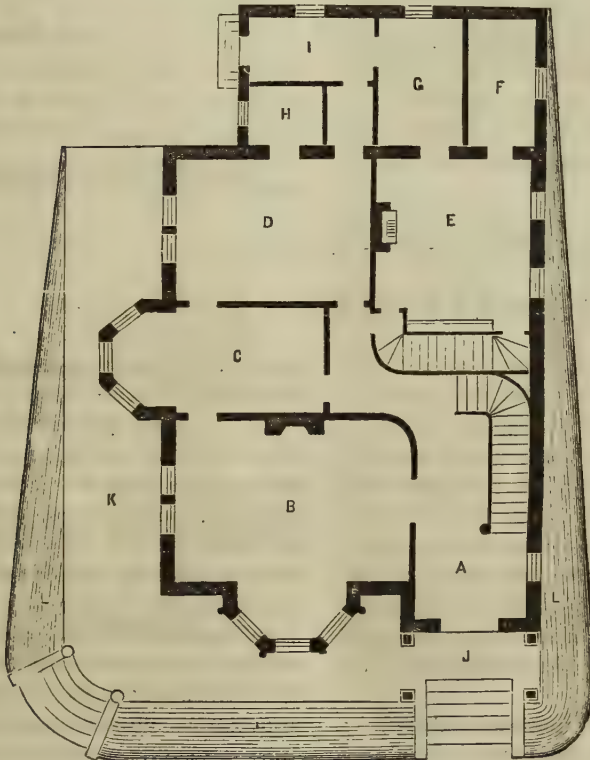
BOSTON BUILDING.

SUBURBAN VILLA IN THE FRENCH STYLE.

BOSTON has a peculiarity or two in its domestic buildings, that we think might be judiciously adopted elsewhere; for, desirable improvements should be shared in by the nation at large; as such are not or ought not to be the exclusive right of any one locality. In this respect ARCHITECTURE is pre-eminently in advance of all the arts and sciences; for, although the architect is ever and always inventing something to add to the stability, comfort, appearance, or economy of his compositions, yet he does not dream of selfishly securing his, frequently very valuable, ideas to himself. No, they are open to all, to be

copied as widely as their intrinsic worth will warrant. This liberality is creditable to the profession everywhere, but nowhere more so than in this country, where every inventor or discoverer of the most unimportant trifle rushes eagerly to the protection of the Patent Office, lest any one else may hit upon the same happy thought, or maybe steal his, and wrong him of his darling property.

Every city has some certain characteristic features of architecture which appear to have sprung into existence in it and been there matured. An interchange of such characteristics would be advisable and desirable amongst the cities of our Union, and this is one of the various uses to which the ARCHI-



TECTURAL REVIEW is dedicated, namely the making the ideas of one known to all, and giving the credit where it is due.

The plan here presented is one of peculiar convenience and economy of space. A terrace is obtained by keeping the basement high and sloping the ground from the rear. The effect is good and the surface drainage complete.

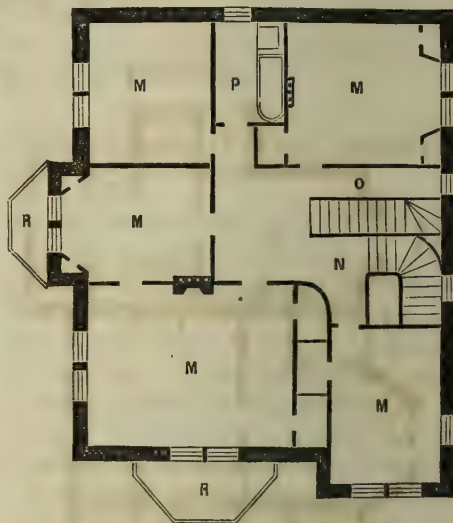
The plan of this villa speaks for itself. The hall is ample and very convenient; the stairs, principal and private, are well situated to give easy access to the upper floors, and the kitchen and dining room are sufficiently removed from the reception rooms to be strictly private. The chamber plan is excellent, giving large and airy hall-way and well lighted bed-rooms, each furnished with what the ladies of Boston so much insist upon, ample closet-room.

A reference to the plan will easily convey the idea of the architect.

A, The Hall. B, The Drawing Room. C, The Library. D, The Dining Room. E, The Kitchen. F, The Pantry. G, The Wash Room. H, The China Closet. I, Passage or back hall leading to yard. J, Front Porch. K, The Terrace.

The upper section of the accompanying double engraving shows the villa in perspective.

The chamber plan is thus arranged :



M, M, M, M, Are the Bed Rooms. N, The Principal Landing. O, Box Stairs and passages. P, Bath and W. C. R, R, The roofs of Oriels.

The Attic is divided into good capacious rooms, one of which is devoted to Billiards.

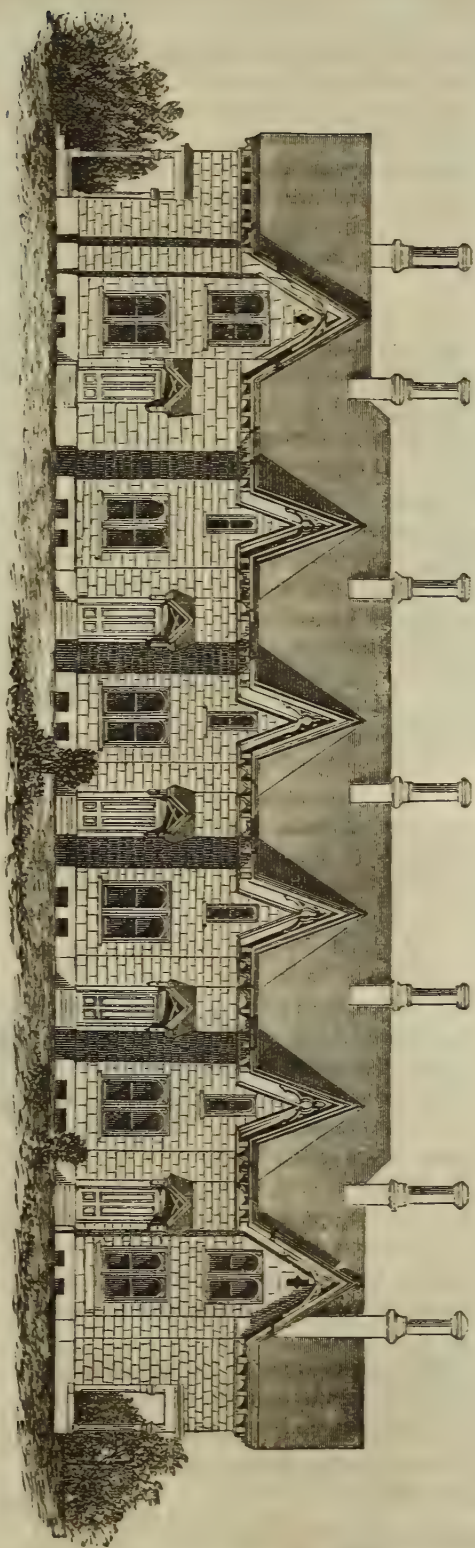
This is a house of moderate cost, the main, or square portion, of which is thirty-one by thirty-seven feet, with a one-story addition twelve feet wide. It may be taken as a fair specimen of its class.

WORKINGMEN'S COTTAGES.

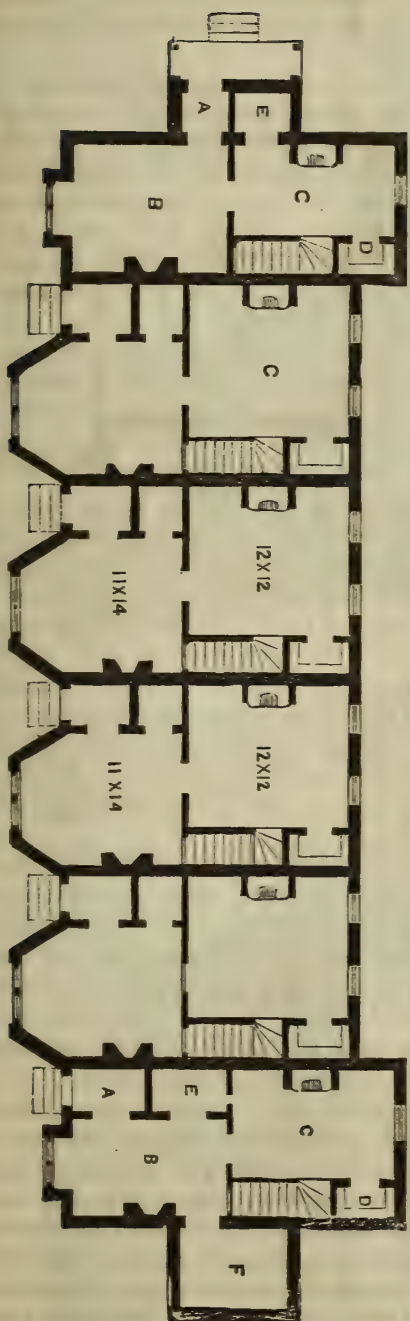
IT is an indisputable fact, and one that should never be lost sight of, that the foundation of society is composed of the working class; and by such title we would be understood to mean the mechanics and the laborers, by the exercise of whose muscle, brain, and handicraft, the necessities of the every-day community are met, and without whose efforts those arts which give birth to luxury would cease to have an existence.

If it be, as it unquestionably is, a thing of necessity that ORDER should be

the first law in the regulation of every community, it must follow, as a thing of equal necessity, that the enforcement of that law should be urged at the *homes*, where abide those who are called upon to obey it, and on whose obedience rests the peace of such community. Order at home must be founded on principles of comfort, which naturally spring from a feeling of satisfaction which has been derived from a gratification of the senses. Thus, the man who has a home, presenting comfort allied to taste, feels a love for it, a thankfulness for its possession,



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WORKINGMEN'S COTTAGES.

and a proportionate determination to uphold and defend it against all invading influences. Such a man is of necessity—we might say selfishly, a good citizen; for he has a stake in the great game of society, and will watch the course of the players with a jealous cautiousness that none but an interested man can feel.

It is obvious, then, that the true policy of every community is to advocate and advance the comfort of the working class, which is its foundation. And therefore it becomes all to have a personal interest in this matter for the reasons given. Such interest can be best subserved by the conjoint effort of the community, to forward and make known the means by which the working class can be put in possession of dwellings suitable to their comfort and productive of that honest pride, which is inherent in every breast, springing from the consciousness that his homestead, though diminutive compared with that of his richer neighbor, is nevertheless worthy of notice, and may have its features of beauty quite as palpably as can the bedizened villa or the gaudy city mansion.

Tenement dwelling buildings are at best but a barricaded nuisance, often, too often, a necessity in our densely populated cities. In such cellular structures the room keeper can never feel that independence which is to be found in "one's own cottage;" for in the one case he is but a fraction, in the other he is a whole unit. The tenement house, or building, is a human conglomerate, compressed into the smallest possible living space, that one man may grow rich upon its very capacity for discomfort.

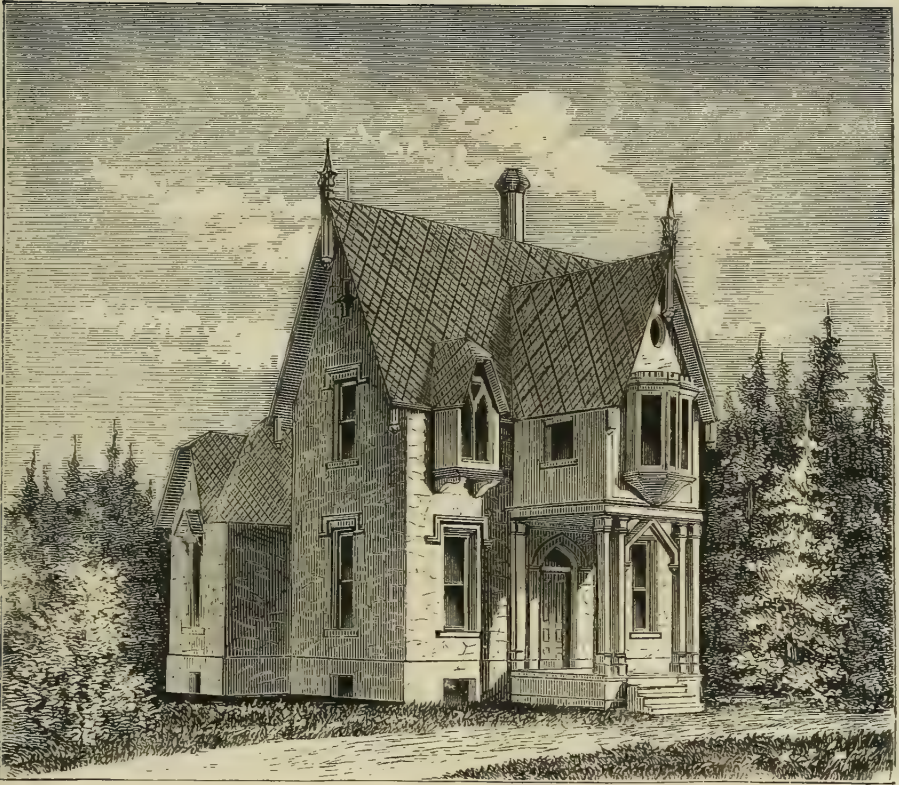
The plans and elevations which we present in this number of the *REVIEW*, are calculated to suit the modest wants of the workingmen's families. Space is made available as far as it is possible, and external appearance is studied with a view to add as much economical

prettiness as the limit of means will allow. This row of cottages presents in its collected form, an air of respectability such as combination is so sure to give.

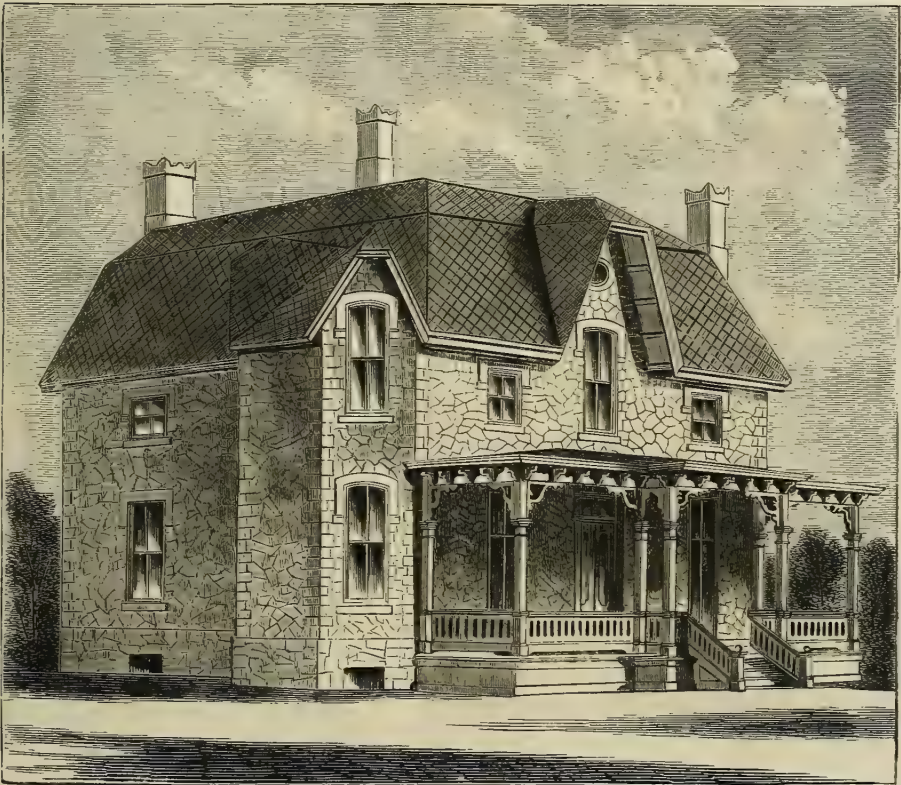
The description of the plans is as follows: The two end cottages have A, the Hall, leading into B, the Living-room; C, the Kitchen, with its range; D, the Pantry; E, Closet; F, Bed-room in the right-hand one; but in the left, E, is a closet off of kitchen, and the entrance, A, is at the side, and is sheltered by a porch over which the room up stairs extends. The intermediate cottages are, as shown, little less capacious, and not at all less convenient than those of the ends. Each has its entrance door wholly distinct from and out of sight of its neighbors. The closet at the back of the hall might have a borrowed light in the wall dividing it from the kitchen. The basement of this row of cottages is intended to be raised two feet six inches above the level of the ground, and beneath the whole will be ample cellarage. This secures dryness to the cottage, besides presenting the greatest comfort which can accompany any dwelling; namely, capacious and well-lighted cellars.

The chimney shafts are furnished with terra-cotta caps, which may be selected of any desirable pattern. In the elevation the engraver has shown an open porch on the right end cottage, similar to that at the left end; but it should be a blank, as a reference to the plan will at once suggest to the reader.

This block of workingmen's cottages may be built in brick, with wooden or stone trimmings; or of rubble masonry, with freestone trimmings; or a very pleasing appearance could be made with vertical boarding, or clapboarding alternated with ornamental shingling, painted a different color from that of the clapboards. The effect produced would be a very pleasing one, and render the block a desirable addition to any suburbs.



TUDOR COTTAGE.



COTTAGE WITH TRUNCATED ROOF.

A MODEL COTTAGE.

WE here present what may be denominated an American cottage, possessing all the advantages of light and ventilation with capacity and convenience in a most desirable degree. It is intended for a southeasterly aspect, and therefore has a verandah shading two of its sides. Projecting from the front of the building above is a chamber, adding much to the appearance as well as convenience of the cottage. It is framed on the front columns of the verandah, of which it is the prominent feature. The bay on the west side is continued to the attic where it is roofed in.

FIG. 1.



FIG. 1. This plan shows A, The Hall with principal stairs. B, Drawing room with bay window. C, Library. D, Parlor. E, Dining Room. F, Pantry. G, Kitchen, with stairs. H, Laundry. I, Verandah.

FIG. 2. J, Chamber over verandah, might be a boudoir or study. K, Hall and landing of principal stairs. L, L,

L, L, Chambers. M, M, Servants' sleeping rooms. N, Bath and Water-closet.

FIG. 2.



This cottage built of hammered free-stone and slated would look well. In brick, with free-stone trimmings, it would likewise present a good appearance, and the wood work executed in well toned, grained oak oiled, would give it all that peculiar style we look for in a cottage.

TUDOR COTTAGE.

THE plan of this cottage has also been given in No. 11, Fig. 3. It is one of those lively little compositions that become so pleasing a feature of a landscape. And even if a number of such cottages are placed adjacent to each other there is a certain unity of feeling presented in their appearance that still further commends them to the eye. Nothing can be more effective, on so small a scale, as the Tudor style in which this little cottage is designed. The accommodation of plan is equal to that of the preceding one, but the position of rooms different; however, the advantages of the one can be had in the other, the style alone making the difference between the two.

A SUBURBAN VILLA.

THIS is a composition in which the trammels of "style" are laid aside, and various features brought together with the intention of producing a unity of effect from diversity of features, and obtaining all possible advantages of light and ventilation at the same time that the contrasts of parts

FIG. 1.



well broken produce all that is desirable in effect by projection and consequent shade. The Tudor is the predominating style in this composition; for, its excellencies in internal arrangement are many, and very desirable in houses of this class.

FIG. 2.



The plans of the stories are as follow: FIG. 1. A, Vestibule. B, Hall and principal stairs. C, Drawing room. The bay in this room is capacious. D, Study. E, The Parlor. F, Dining Room. G, Kitchen, with tower stairs, H, leading to servants' sleeping rooms. I, The Storeroom. J, The Plate Pantry. K, Closet. L, Vestibule.

FIG. 2. M, M, M, M, Chambers. N, Bath and Water-closet. O, O, Servants' sleeping rooms.

COTTAGE WITH TRUNCATED ROOF.

BEFORE the introduction of the Mansard roof, the truncated presented the desirable quality which none other of its day possessed, of head-room in the attic story. Yet its exceeding heaviness gave it an intolerable gloominess of appearance that prevented its being used much in any save farm houses. In the design before us with the prominence of verandah and the easy curve of the window caps, the truncated roof, modernized by ornamental slating, has a good substantial effect, but still looks to more advantage in the country than in the suburbs.

The plan will be found at page 692, Fig. 2, and affords the following accommodation:—Being L shaped it has a hall and two rooms in front and one room in the rear with a pantry between. There are three chambers with closets over head. The plan is capable of enlargement, as it can be a square, owing to the peculiar form of the truncated roof, and in case the square plan is adopted the accommodation is ample. It will be observed, too, that there is attic space in this design, which, though necessarily limited, is nevertheless a very desirable addition to the capacity of the house.

SUBURBAN VILLA





CITY DOUBLE RESIDENCE.

THE plans here presented are of one of a double residence in a city. It will be at once seen that the accommodation is very complete, and the convenience throughout is all that could be wished in this class of house.

FIG. 1. The first story is as follows: A, Vestibule. B, Hall, with staircase; under which and off the passage to Kitchen is a water-closet. C, Library, with closet, and recess for a book-case. D, Principal stairs. E, Private stairs, boxed in F. G, Kitchen, with range, dumb-waiter, &c. H, I, Laundry, with wash-tubs and boiler. I, H, and F, have glass partitions.

FIG. 2 shows the arrangement of the second story, which is really the principal.

one, differing in that respect from the generality of American houses. J, the Drawing-room, with centre sliding doors. K, K, Dining-room and Hall. M, Boxed stairs, leading to third or chamber story.

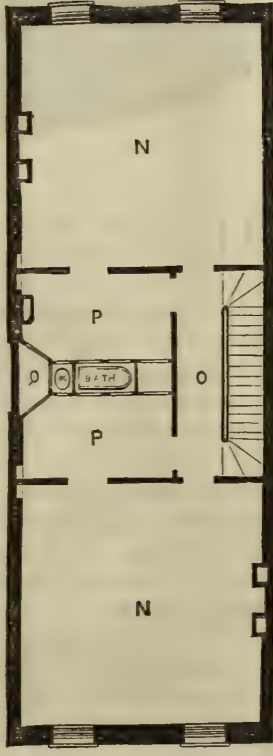
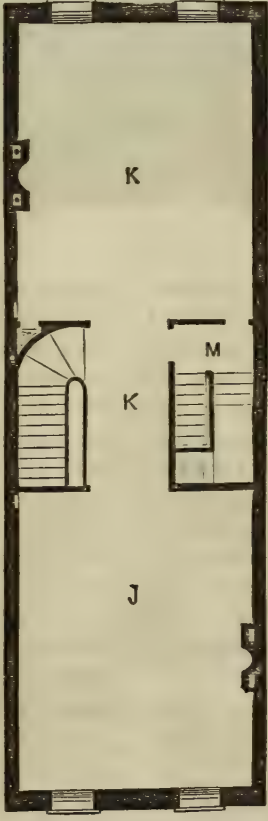
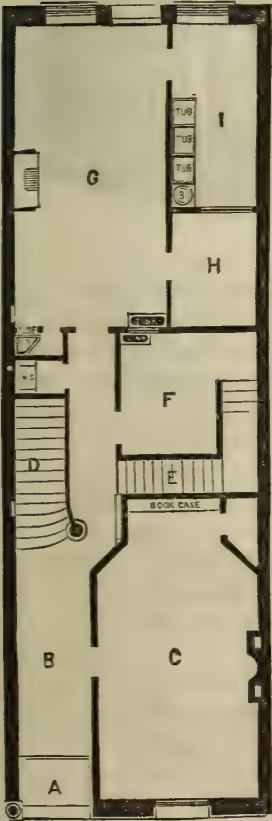
FIG. 3 shows plan of third story. N, N, Chambers. O, Passage. P, P, Dressing-rooms. Q, Skylight. This story is also furnished with Bath and Water-closet.

The stairs lead to the fourth story, which is laid out on a precisely similar plan. A Mansard roof would give still another, or fifth story, with the same arrangement of rooms. One of the advantages of this plan of house is that all the plumbing is confined to the centre, and thus much economized.

FIG. 1.

FIG. 2.

FIG. 3.



A COUNTRY CHURCH.



HERE is a neat, and not unpicturesque little edifice well suited to a small village or hamlet. It might be constructed in rough hammered stone, or in brick with hammered free-stone trimmings. It might be moulded in concrete or in Bêton. And in a wooded country in any of the various modes of construction in that material, such as *frame, plank* (vertical or horizontal) *log* hewn on the inside—sawn and squared log. All these latter modes would be excellent in back settlements, thickly wooded.

VALUE OF HOLLOW BRICK.—A mason employed on some repairs to a chimney of a house in Paris, while at work, broke

up a brick which he found loose in the chimney, and, to his surprise, discovered that it was hollowed out, and contained a bank-note for five hundred francs. The workman honestly communicated the fact to his employer, who called to mind that he had written his uncle at Amsterdam, for money, and had received nothing but the brick in question, which he indignantly threw into the chimney, and wrote his uncle an angry letter, to which no answer had been given. In Holland, it seems that hollow bricks are made on purpose to send small sums of money, as making a more secure package than others. We suppose that Dutch uncle was thereafter considered by his nephew, to be a *perfect brick*.

YORK CHURCH, ENGLAND.

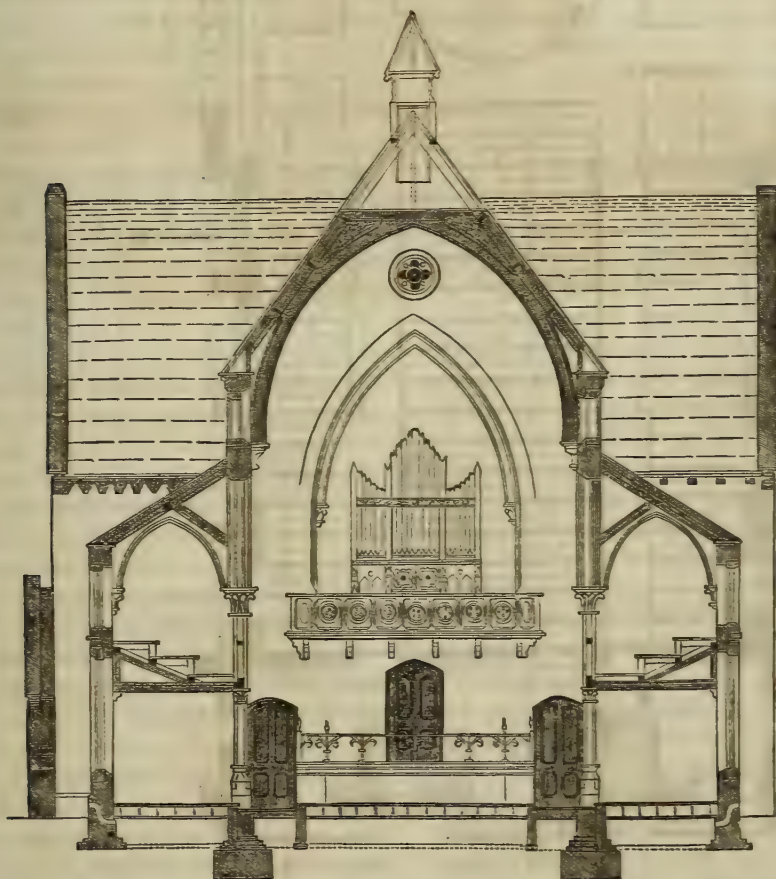
THE plan and section here given should have accompanied the perspective illustration presented in a preceding number, but the Architect, Mr. WILLIAM PEACHEY OF DARLINGTON, had not furnished it until lately, owing to the great pressure of his professional business. The arrangement speaks for itself, and has many points which will be new to some of our readers, and interesting to all.

REFERENCE TO PLAN on next page.
A, Nave divided by two aisles in

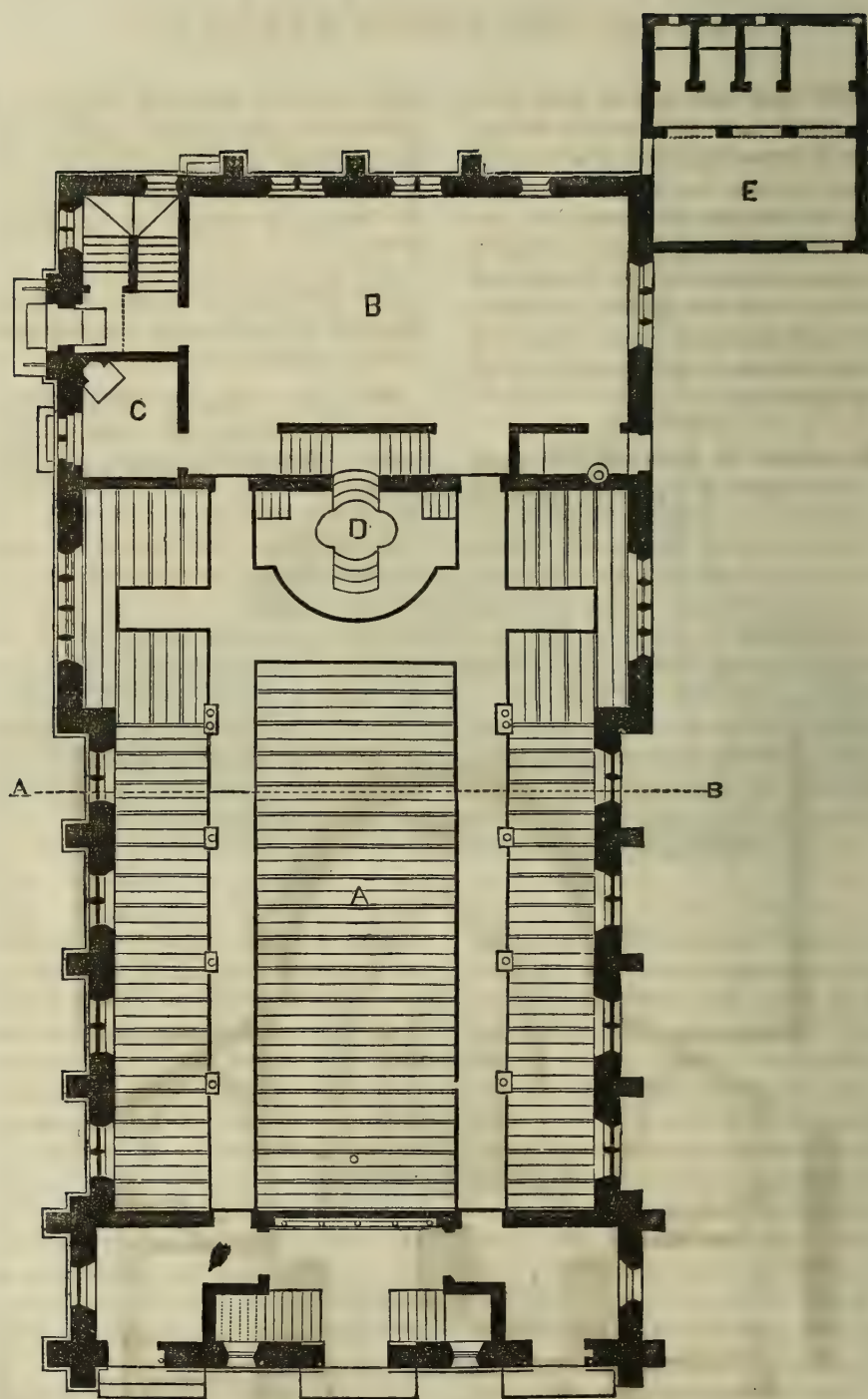
which are the clerestory columns of polished iron, those of the chancel arch being double, or in pairs on one base. B, Class-room with School-room over. C, Minister's room. D, Baptistry. E, Yard.

THE SECTION is through A—B on plan and shows the choir, the side galleries, the clerestory and the roof.

The space under the floor of the church is ventilated, as shown on section, by flues having gratings on the outside.



SECTION OF A CHURCH AT YORK, ENGLAND.



ARCHITECTURAL DESIGN EXHIBITIONS.

THERE is a want, a very great want of some general mode of communication between the public and the architectural profession at large. At present there is no means of knowing the relative ability of architects throughout the country, unless each office, in each city, were to be critically visited, and examination freely permitted. Of course this is obviously an absurdity, and only put forth here to show how utterly impractical it is for the public to become acquainted with all the architects of the land, as matters are at present situated. That there is much talent circumscribed by locality cannot be doubted. Architects may work out a lifetime in one city, and be, comparatively, unknown beyond its limits, even unknown to their professional brethren in other cities. Now this is entirely wrong. There is no necessity for a continuance of such separation of minds that ought to be in community for art's sake. But how is the defect to be remedied? We fancy the simple remedy lies in the necessity for association in each and every city; and with such association a well sustained inter-communication throughout the country, from north to south, from east to west. Let every city have its established place of meeting, where the stranger architect may go and get acquainted with his brother professionals. Where *conversations* may give a chance to the amateur or the admirer of architecture to exchange ideas or receive desirable information. Where the professional man from abroad may easily find himself at home amongst art kindred.

Annual assemblies to be held in each of our large cities alternately would aid the cause of progress very much, and enable the Northern architect to personally study the practice of the South and the West, and in fact afford to all a

most desirable opportunity of becoming fully acquainted with each other. But the great effort towards advancing the best interest of our profession would be NATIONAL EXHIBITIONS OF ARCHITECTURAL DESIGN, either annual or semi-annual to be held at Washington; that being the centre at which is concentrated, each year, all the mind as well as the monied *material* of the nation.

Each city might also have its local exhibition once a year, and at such might be selected designs worthy of a position in the great National Exhibition at Washington.

To every reflecting mind it must be obvious that such efforts as these cannot fail of success in drawing forth the public patronage for an art that is so symbolical of a nation's genius and refinement.

The pages of a magazine never can afford the opportunity of exhibiting fully the ideas of an architect. Engraving, however good, can never show on a diminished scale the beauties of a design. The drawing itself, fresh from the hand of the designer, is what is wanted. But, whatever be the course pursued; let liberality and unanimity be the leading characteristics of our profession in the future; for egotism and envy are the indelible marks of little, mean, ungenerous minds, who dread the light which must display their innate selfishness, and stolid ignorance.

 OLD PROVERBS.

Consult the stars, and rule the planets well, before you build a wall, or sink a well.

A castle wall to be stout, must be filled with mortar and grout.

Bricks are never well set, unless they are first well wet.

If you would make a wall stand, use good lime and clean sand.

RAT-PROOF BUILDING.

THERE are cities in our Union which, far more than others, have to endure the fearful plague of rats, and which on that account demand the especial care of both architect and builder to provide against the encroachment of these rapidly increasing nuisances. This matter has now assumed a very serious shape; for the destruction of property is unlimited so long as the vermin can find a shelter and an unopposed entrance into every story of a building. Chicago is a serious sufferer in this way—and not alone Chicago, but Detroit, Toledo, and in fact every city where adjacent water and low swampy ground offer inducements to this destructive fraternity to colonize.

Chicago, on account of her grain elevators and store-houses, is particularly favored by these settlers; and to that extent that the losses sustained by shippers is not alone very palpable but remarkably progressive.

Property owners have a great interest in the total exclusion of rats from their premises, and look to builders for security in the future. Rat-proof building is therefore a requirement that must be met, and cannot be any longer deferred. The fact is, the whole system of construction in this regard is exceedingly defective, and it is strange that century after century have we been, and are yet, erecting store-houses, market-houses, and dwelling-houses, without taking the slightest precaution against the evil we know to exist. On the contrary we actually give the rat the very means of entrance he desires, and if we were his most anxious friends we could do no more. The active little marauder cannot alone find ingress through the cellar floor, but the roughness of the rubble stone wall inside, affords an easy stepping for him to reach the first tier of joists, and when once there, he is

"all right;" for, does he not find that there is a broad wall for him to walk upon between the joists, and does he not see how easy it is to climb these rough joists and at his leisure cut a passage through at the ends of the flooring, which seldom go close to the wall—at least so close as to make his work at all troublesome. Thus has the rat secured admittance for himself and followers, and the work of plunder goes on in earnest. In our dwellings, the skirting or base-board of the first story has always a very convenient space behind it left open, as if purposely, for the accommodation of rats and mice.

Now it is time, certainly, that all this negligence in building should be peremptorily stopped. There is not the slightest reason why it should not be. In the first place, the footings of foundations should have at least three ample projections. And this is not alone a precaution against the burrowing down next to the wall, of the rat, but it is a security to the building itself, and ensures its stability. The floor of the cellar should be cemented or concreted, at least four inches thick, inclining upward against the walls all around, thus giving additional thickness where the intruders are most apt to emerge.

A great deal depends on the thoroughness of this cement floor to render the building rat-proof. It will also have the desirable effect of making it dry.

The usual offset on the inside, for the flooring joists to rest upon, should be made on the upper line of the joists, and the cellar wall be continued flush up; the joists should be built in, and it would be a safeguard against *rot* to char the ends of the joists thus bedded so that any possible damp or ill effects arising from the exclusion of air, might not have a chance to arise.

On the first story, and indeed on all

the stories, the wall-plastering should be continued down to the floor and no space whatever left behind the base-board or skirting, pounded glass mixed in with the mortar used in this back filling would effectually guard against rats and mice.

It happens sometimes that although the cellar is made perfectly impervious to the invading enemy, that he will find his way in through an open door or window, and once in possession, it is difficult to dislodge him, unless the precautions we have spoken of are followed out, for he will of course try to secure himself beneath the floor or behind the base-board, and failing in these, he will make his way to the attic and seek out a refuge in the numerous loose and open places there to be found. Now, it would be as necessary to close all spaces about the timbers of the roof in connection with the walls as it is to secure the flooring joists, and in fact to finish every part of the whole construction with an unwavering determination to debar the rat and mouse of their presumptive rights of domain.

The extra cost of thus doing work as it ought always to be done, would be slight indeed, compared with the damage incurred by its neglect.

As it is, our dwellings are infested with vermin because we afford them passage-ways and living places between the ceilings and the flooring to which the entrance from between the joists, is too often quite open.

But there is still another, and, if possible, a still more convenient asylum for the forbidden quadrupeds to be always found in our system of open partitions of studs, lath and plaster. On the inside of these constructions the lathing acts as a most perfect ladder for the inter-communication of floors all the way to the roof, and in vain might we back the base-board with plaster as long as those partitions are open. This is a point of such very great importance in construction, that it calls for all the

inventive ingenuity of our practical men to improve upon it. These partition walls should be solid and at the same time not too heavy. There being solid will most probably reduce their thickness, and consequently there will be a saving of space in the apartments divided by them.

We have now brought this subject, with all its importance, fairly before our readers, and we trust that it will draw forth their opinions and suggestions to the end that we may at last fully realize the erection of positively RAT-PROOF BUILDINGS.

COLORED MARBLE.

WE are in possession of several varied specimens of colored marble from a new quarry which will be soon sending its treasures into the building world; and here we may just hint that the material of which we speak is unquestionably without a rival either here or in Europe. It is not alone remarkable for its vari-colored beauty, but it possesses a uniformity of grain, and equality of hardness, that render it at once a superior article to anything in its peculiar class we have ever met with. It is fully equal in tint and demarkation to the "antique," and in texture much more reliable. We propose to treat on this subject of marbles early in our next volume, giving a commentary on most of the known classes—Grecian, Italian, Sicilian, and Irish, and our own native marbles, of which the specimens before us will justify a reasonable degree of pride.

DEODORIZER.

THE smell of new paint may be readily subdued by spreading around old clay, which must be kept constantly wet, or at least damp; for the oily vapor does not seem to be readily absorbed unless the air is kept moist by evaporation.

EDUCATION FOR MECHANICS.

IS it not a fact that our system of public education is exceedingly defective, notwithstanding all the pride we take in it? The great bulk of those who look to district schools for mental nourishment are our future mechanics. And what do they learn? Reading and writing, arithmetic and geography. Now these are all desirable, every one of them. But do they embrace what the future mechanic wants? No, most decidedly they do not. In arithmetic do they not positively waste time on studies which will never be of use to them—and in *algebra* do they not waste their valuable hours over, to them, abstruse deductions, which could be better learned when the want of their use was felt and understood? In the time wasted over geography (we mean of course unnecessary study of that branch) it must be confessed that golden opportunities are lost to the embryo mechanic.

In these remarks we would be distinctly understood as merely alluding to what might be done for a large class in every community, who at present are forced to put up with the same mental discipline that is bestowed on the future banker, merchant or trader, to whom the wants of the embryo mechanic are foreign. For instance, the class we speak of, should learn *mensuration*, *practical geometry*, and the primitive principles of *drawing*. These branches we know are taught to those who can afford the time to reach them in the upper departments, but that does not meet the requirement. Most of the boys we allude to leave school, and go to work long ere they can be inducted into the studies so absolutely necessary to them and their future welfare.

There is a neglect of primary geometry that should not be any longer permitted to exist. In fact there is a crude

idea prevalent amongst the majority of teachers that geometry cannot be elucidated to youthful minds. What absurdity! when we see these same teachers demonstrating to these same pupils the rotundity of the globe, the orbits of the planets, and in fact the most abstruse problems as compared with the simple axioms of geometry. A very youthful mind can with a knife and an apple model out some of the choicest problems in conic sections. Cannot that same mind be taught the philosophy of the section he has so naturally made?

The time devoted to singing and committing to memory the State capitals, territory and population, with the lakes, rivers, mountains, and so forth, which go to make "Uncle Sam's Farm," could be far more advantageously employed by the mechanic student in learning *duodecimals*, *mensuration* and *practical geometry*, the want of which they are sure to feel hereafter, and which they must acquire at private tuition, to be paid for out of their apprentice allowance, when they could have acquired it all at school. We would put the question here—Is this doing justice to a very large portion of the growing community, on whose future knowledge and handicraft so much depends?

If the teachers of the higher departments are well qualified to instruct and finish those who are able to work their way up to them, all right; but it seems to us that the lower department might take up the question of the mechanic student's educational wants and feed his mind with instruction on which he can hereafter gain his living, even to the exclusion of both surplus geography and acquirement of vocal music.

In plain English—UTILITY is the one thing wanted in our public schools.

MORTAR.

WHAT a simple word, consisting of but six letters, yet what a mighty work it does!

"The cloud capp'd towers, the gorgeous palaces,"

are all dependent on its adhesion to their cause, and without it they could not assume the proud position they hold, no more than the ambitious little creature *man* could live without breath.

MORTAR is the life of masonry, as masonry is the minion of man. It binds the slave to his master's will, and is, in fine, the good genius of BUILDING.

That this friend of our species, this best ally of our enterprises in raising enduring monuments to fame, should be well treated, would seem natural enough, and yet the exception is too often the rule. Here, for thousands of years, has man's intimacy with Mortar been great, and yet our knowledge of it to-day is actually more theoretic than practical.

The ancients had more sense in this respect than we, and studied well the nature and properties of this great material, and they were repaid in the endurance of their structures; which, after centuries upon centuries of existence, are to-day more stable and more likely to remain than nine-tenths of the buildings we, in our generation, attempt to make lasting.

VITRUVIUS has given instructions on this subject which it would be well if our modern builders would study and practice. After descanting on the nature and quality of the various sorts of sand, he says:—"We proceed to an explanation of the nature of lime, which is burnt either from white stone or flint. That which is of a close and hard texture is better for building walls, as that which is more porous is better for plasterings. When slaked for making mortar, if pit sand be used, three parts of sand are mixed with one of lime. If

river or sea sand be made use of, two parts of sand are given to one of lime, which will be found a proper proportion. If to river or sea sand, potsherds ground and passed through a sieve, in the proportion of one-third part be added, the mortar will be better for use. The cause of the mass becoming solid when sand and water are added to the lime, appears to be that stones, like other bodies, are a compound of elements; those which contain large quantities of air being soft, those which have a great proportion of water being tough, of earth, hard, of fire, brittle. For, stones which, when burnt, would make excellent lime, if pounded and mixed with sand, without burning, would neither bind the work together, nor set hard; but having passed through the kiln, and having lost the property of their former tenacity through the action of intense heat, their adhesiveness being exhausted the pores are left open and inactive. The moisture and air which were in the body of the stone, having therefore been extracted and exhausted, the heat being partially retained, when the substance is immersed in water before the heat can be dissipated, it acquires strength by the water rushing into all its pores, effervesces, and at last the heat is excluded. Hence, limestone, previous to its burning, is much heavier than it is after having passed through the kiln, for, though equal in bulk, it is known, by the abstraction of the moisture it previously contained, to lose one-third of its weight by the process. The pores of limestone being thus opened, it more easily takes up the sand mixed with it, and adheres thereto; and hence, in drying, binds the stones together, by which sound work is obtained."

In the admixture of the lime with the sand, for the production of mortar, the greatest care must be taken that the in-

redients are most intimately mixed, and that no foreign matter (especially vegetable) be suffered to intrude itself into the mass. The water, if hot, causes the mortar to set more rapidly, and only sufficient should be applied to give consistency to the mass. The exact quantity of water to be used in slaking must depend on the capacity of the lime to absorb it, for this and no more must it do."

But the chief care in the making of good mortar must be had in the repeated beatings and turnings it is to have. And here let us say that our inventors

would confer a great benefit on the building community, and indeed on the world at large by the construction of a suitable mill for working up and tamping mortar in such a manner as to ensure every particle of the mass receiving its due share of attention. In this way we would have good, tenacious, and most enduring mortar which would defy alike the destroying influences of time and the elements, fully as well as that of the ancients. Is not this a subject worthy of deliberation? Is it not one to be reduced to practice in our boastful age of great advancement.

THE BATHS OF DAMASCUS.

THE season is upon us when the bath is not more a luxury than a necessity, and we of Philadelphia, as well as our neighboring cities throughout the Union, know it and feel it. At such a time then, there is something bordering on satisfaction even in reading of the luxuries which others enjoy not with a feeling of envy but with a philanthropic pleasure to think that all the world is not quite so sordid as to be entirely thoughtless of the comforts of their brethren of the vast human race.

ADDISON, in his entertaining and highly instructive book of travels, in the second volume says:

"Damascus is one of the most venerable cities in the world, for its antiquity. It is supposed to have been founded by Uz, the son of Shem, the first son of Noah, and is known to have existed in the time of Abraham. For three centuries it was the abode of the Persian Kings. Here the houses have externally a very mean appearance, presenting only a dead wall of unburnt bricks, towards the street, with one or two windows, possessing no glass, but filled with a thick lattice, formed of cross bars of wood. The cold air is excluded at night by a sliding shutter, fastened by a wooden

bolt of curious construction; the inhabitants sleep on the tops of the houses in the summer season, with their clothes on, which they only take off when they go to the baths.

"The baths at Damascus, and the manner of bathing being the same as in Persia, we shall give an interesting description of one of those places in that ancient city, with the process of purification.

"Here the delicious custom, so often mentioned in the Arabian Nights, universally prevails, of going to the bath after a long journey through this parched country before he puts on clean linen, having previously laid down at every place of rest in his travelling habiliments. Having packed up our clean linen and sent them by slaves we proceeded to the principal bath of the city of Damascus, called the Bath of Musk, which we approached through a court in which was an ornamented fountain that threw up a stream of water seventy feet into the air, and again returning, produced a refreshing and pleasant coolness. Our entrance into the bath was by a small door, which opened into a vast circular saloon surmounted by a large dome, and paved with marble. In the centre of

which a large fountain was bubbling over, and rolling into a circular marble basin below. The scene on entering, to a novice, is very astonishing; around the large circular hall were raised platforms or divans, covered with carpet, and beds in alcoves, inclosed by curtains. On the raised divans might be seen the most extraordinary grim figures imaginable; some, rolled up in towels and napkins, lie extended at full length, smoking; others sat up sipping coffee. Some were divesting themselves of their garments, assisted by a black slave, and others were in a complete state of nudity in the act of having a towel wound round their waists. We were allotted a raised recess covered with carpets, in which little couches were quickly prepared with cushions and linen sheets. Our little bundles of clothes being deposited by the side, we commenced undressing. An attendant stood close at hand with towels, and as we were successively reduced to our last garment, he wound a towel round our waist. Being now completely stripped, a long towel was thrown over our shoulders, and another, wound in the shape of a turban, round our heads. As we successively descended the platforms, a pair of pattens, called *Kab-kabs*, about a foot high were placed for us to get into to protect our feet from the wet, cold, marble pavements. We accordingly, with our serving-men, entered into the first room, which was vaulted and paved with marble, and moderately warm, and then passed through rooms enveloped in mist, each succeeding room becoming hotter and more dense with steam, in which might be seen strange unearthly objects; some lying extended on their backs upon the floor, while wild-looking men with bald heads were pounding and rolling them. Some stood up to their knees in large circular basins of hot water; others were seated on their haunches, covered from head to foot with soap-suds, lathered over them with an implement like a horse's tail; others

were being almost scalded with hot water, which was poured over them from buckets, while others sat quietly smoking or sipping coffee on marble divans unmoved by the puffing, washing, and scrubbing around them; while men with gray beards, and young boys without any, were all quietly in a state of nudity rocking about, appearing and then vanishing again in the fog.

"We sat down on a marble bench in the last room of all, the atmosphere of which was very hot and oppressive at first; this, however, soon went off, when a profuse perspiration broke out and trickled down from every pore; coffee and pipes were brought in and handed round to us. It is usual to rest about half an hour or longer, according to fancy, to allow a thorough perspiration to break out. After taking and sipping your coffee for some time the different attendants we had chosen came up, and made overtures to us to come and be scrubbed, which we successively yielded to, as our pipes were finished and our coffee drank; and we were each of us conducted to some quarter of this or the adjoining room, under a cock of hot water, where takes place the following process. The attendant puts on a mohair glove and constantly dipping the glove into hot water and almost brings away the skin by the hardness of the rubbing. When he can get no more dirt off of your body he draws a long breath, muttering an ejaculation of '*taieeb, taieeb!*' (good, good,) expression of satisfaction, and then pushes you down on your back, extending you at full length on the marble floor. He now pinches and squeezes your shoulders, arms, and all your limbs, then pulling your fingers he makes the joints crack with a startling loudness; he then applies himself to your arms and legs, moving the bone about in the socket in an alarming manner. Now raising your shoulders he pulls you up, and putting his knees into the small of your back, gives you a twist and a crack that

makes you wince, and then clapping his hands shouts, 'Taieeb, taieeb thatier !' meaning to say that the whole thing has been completely done. An attendant now appears and binds a dry towel around your waist and head, and another over your shoulders, as at the commencement, and you are led out, scarcely able to stand, through the heated rooms into the cold external hall, where the transition is quite as great as that of a man going naked out of a warm room, on a winter night, into

the external air, when the thermometer is ten degrees below freezing point; the temperature of these baths being from one hundred to one hundred and five degrees, and the exterior hall at the time we visited, at sixty-five to seventy degrees. The effect, however, is very different; cold is said never to be taken, and we never experienced aught but the most pleasant and agreeable feeling; tightness, pains in the joints, and fatigue vanish away, and you think of nothing but pleasure and happiness."

DEODORIZER FOR STABLES.

THERE are few men who do not admire the horse and look upon him in a light very different from that in which other domestic animals are viewed. Woman is no less an admirer of this incomparable creature than man. The stable of the horse is sought to be healthy and comfortable, and many that we know of are really admirable. Some of our millionaires have gone to very great expense to house this favorite animal, and all that science knows has been called forth to aid in making stables all that they should be. Yet, with all this care and desire to be careful of the horse, there is ever one drawback, one objectionable thing in even the choice stables of royalty itself, let alone republican munificence, and that is the effluvia ever present in, and seemingly inseparable from, the stable, however cared for. On account of this most unpleasant smell ladies very seldom pay a visit to the stall of their most petted animal.

It does seem extraordinary that science has hitherto offered no palliative of this ancient evil. The boon seems to be reserved for our day, and we hail with hope in its efficacy the following suggestions, namely, sawdust mixed with diluted sulphuric acid; it is one of the best materials for fixing the ammo-

nia which is given off in stables. The following experiments have been put on record: A shallow basin, in which sawdust diluted with sulphuric acid was spread, was hung up in a stable; the sawdust was neutralized by the ammonia in the air of the stable, and a considerable quantity of the sulphate of ammonia was formed in this manner. For this reason sawdust, mixed with sulphuric acid, is recommended as a means of keeping stables sweet and wholesome. This acid should be diluted with forty times its bulk of water before it is applied to the saw-dust. Just enough should be applied to make the saw-dust feel damp. On account of its porosity, saw-dust retains the acid very perfectly, and presents a large surface for the absorption of the ammonia.

CONDENSATION ON GLASS.—This is a subject in which so many (especially store-keepers) are concerned that we give the following as a very excellent remedy:

Mix intimately three pounds of potash with one pound of common salt. Spread it well, or dissolve it in as small a quantity of boiling water as you can; soak it all up with dry cloths, and spread them near the glass.

STORE FRONT ARCHITECTURE.

THERE is no one department of the profession of Design which so tries the ability of an architect as that of Store Fronts.

In the vast majority of mercantile pursuits, light and display are the requisites next in importance to space. To afford all possible accommodation in two such imperious necessities and at the same time to struggle against limit, often serious limit of frontage, is the supreme difficulty and one that must be overcome or the design cannot, in the business view of the matter, be at all satisfactory. It is in vain for the architect to attempt any defence of his ideas, backed though they may be by all the known authorities in his profession, the merchant sees the thing in his own peculiar light and will not see it in any other. Why should he? His business is display, and if that display can be procured through the medium of taste and without violating any of the rules of propriety in architecture, so much the better. But if, on the contrary, such cannot be effected, the consequence falls, unfortunately, on the side of taste, and the architect has to forego his innate feeling and yield to the demand of necessity.

The general public will possibly admire the very failure he deplores, but there is ever a scrutinizing eye that scans design with a view to fault-finding, and it is that evil eye alone whose piercing, unrelenting test the architect stands more in dread of than of the perpetually recurring observation of the passing multitude.

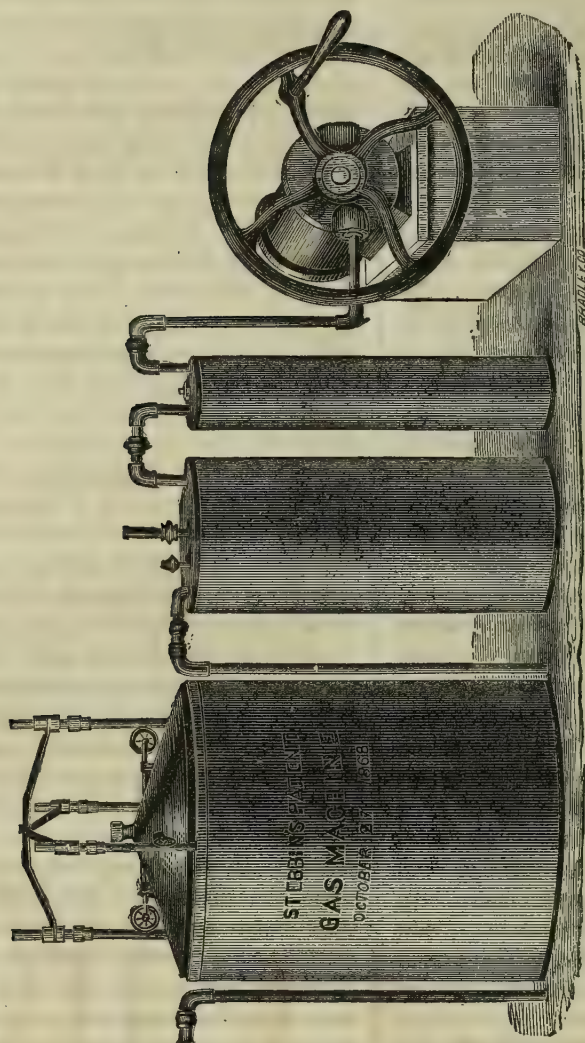
How then are we to judge these store designs? Can we place our hand below our eyes and shut out the store, seeing only the superstructure from the bressummer line up? It is a difficult task indeed, for the idea of heavy piers of

masonry, however proportionate to that superstructure, being sustained between earth and heaven by fairy like columns of attenuated iron (and mayhap but four of these) the thing seems quite too preposterous for the mind to bear with anything like ease. There is a dread, an uncomfortable realizing of the precariousness of one's position when standing under that impending mass of superstructure defended by tiny stems, and sheets of scarcely discernable French plate-glass, that must always prove a most serious drawback to the gaudiest display of fancy work, however otherwise attractive to customers.

But how is this dilemma to be overcome? Some efforts have been made to continue up the fragile appearance of the store, and thus produced an elfin dream of a building all glass and framing. The practical disadvantages of such a construction are numerous and so apparent to every mind that it is unnecessary to name them here. And, after all, does this treatment really overcome the difficulty? Certainly not—the columns, so called, of the store are diminished to the very smallest possible diameter, and consequently those of the superstructure could not be less, and being over each other for, say four stories, the appearance is still more visionary, and fear inspiring.

The spider weaves his gauzy web on the suspension principle; man undertakes to construct those webs of commerce of which we speak, on no principle at all.

Here then is a fair and open field for the inventive genius of our profession to exercise itself upon, and he that comes the nearest to a realization of the wished for solution of this riddle of design will deserve well of the world of sense and and true taste.



STEBBINS' IMPROVED PORTABLE GAS APPARATUS.

PATENTED OCTOBER 27, 1868.

The most perfect machine for producing artificial light yet invented.

ARCHITECTS are constantly asked by their clients to procure the most practical generator of gas with the fewest objectionable points. Now it is a painful fact that the great majority of those urged upon them for their patronage have some serious defect, to the architect, of course, unknown until the apparatus has been purchased, set up, and a-going. To the profession, then, the introduction of a well-tried and really good one is a desideratum which we fervently wish to see them possessed of; for, the many portable and other gas machines that have been presented

to the public since the abundant supply of petroleum from its fountains in the fertile earth have foreshadowed that a purer, better, safer, as well as cheaper artificial light is to be added to the home comforts of our land.

Practical trial has revealed defects causing the abandonment of one after another machine possessing some good points, but on the whole unable to stand the test; and it is because the one now offered has been put to the proof in able scientific hands and with the most satisfactory results, that we are confident.

The process is so simple that it can-

not fail to be readily understood. The machine consists of few parts, so combined as to remove the liability to get out of order. It is adapted to ordinary dwellings, shops, churches, schools, hotels, factories, &c., and can be used on a large scale like coal gas, for lighting whole villages. A child, by a few minutes labor, can supply the light for a dwelling for an evening.

The gas flows with the greatest freedom through the pipes to any height.

The light is unsurpassed for brilliancy, purity and steadiness.

There is no sediment gathering in the pipes. Ordinary prudence renders it absolutely safe, and it costs *one-fourth the average price of coal gas.*

This apparatus has been introduced into Amherst College, Massachusetts, and carefully tested by the distinguished Professor of Chemistry in that Institution. His testimony, worth a volume of unscientific commendation, is conclusive as to all the important points above stated.

Professor Harris says: "The ma-

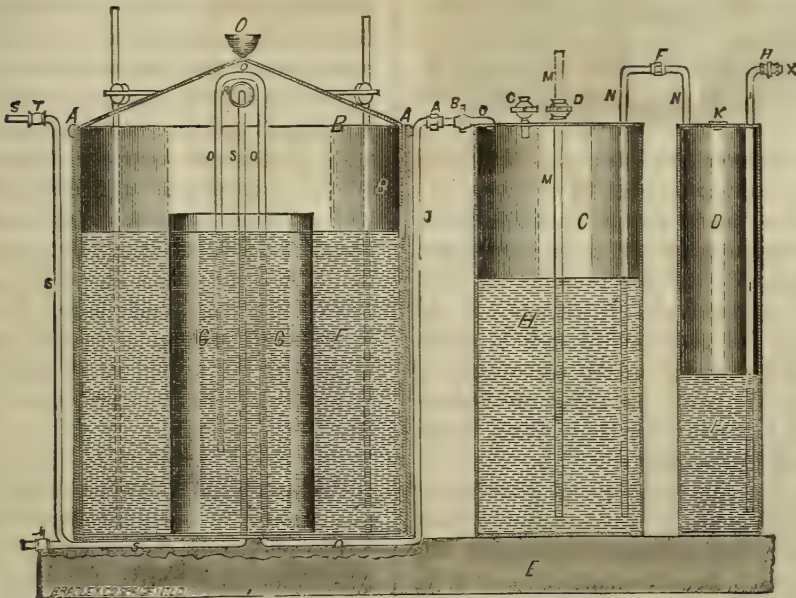
chine in its present position (six feet from furnace) is fully endorsed by all the Insurance Companies, six (6) in number—some of the best in the country."

It may here be mentioned, that several other first-class companies have given their approval—among which is the Continental of New York, one of the largest. "I find it," continues Professor H., "*safer than coal gas,* and to my surprise, having mixed it with all possible proportions of air, I am not able to get an explosive mixture.

"Its illuminating power in an Argand burner, consuming three and one-half feet per hour, is eighteen candles. (The same burner will consume seven feet of coal gas and only equal the light of sixteen candles.)

"The flame is not thick and opaque, as in all other gas machines from gasoline I have seen, but is clear and steady as in coal gas, and there is no perceptible odor from the burning of it.

"It is well adapted for Laboratory purposes, working well in a Bunsen burner, and giving a good and elegant



- A, Pipe leading from Blower to Water-valve.
- B, Pipe leading from Water-valve to Carburetter.
- C, Pipe for filling and emptying Carburetter.
- D, Escape for air while filling Carburetter.

- E, Pipe leading from Carburetter to Receiver.
- F, Service pipe.
- G, Drip pipe.
- H, Internal Cylinder.

heat equal to coal gas for all ordinary purposes for which the Bunsen burner is used.

"The gas does not fall, but rises."

This is the only portable machine we know of making a gas that will not condense.

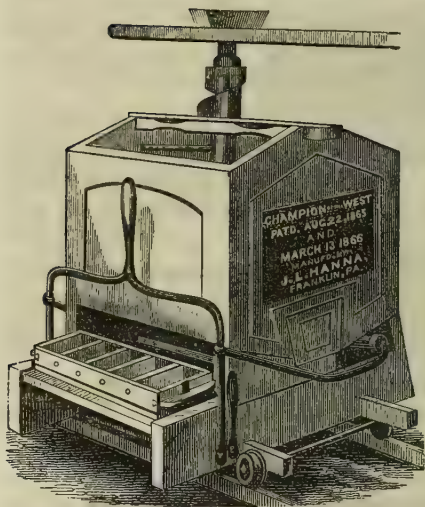
Other machines do not make gas, but simply use the vapor of gasoline, which in an ordinary house using twelve or

thirteen burners will sometimes condense in a single evening two quarts, and unless the pipes are so arranged that this can return to the drip pan it must remain in the pipes.

The prices of these machines vary from \$150, upwards.

They can be seen at the Agents', Gregory & Stewart, 447 N. Broad street, in this city.

A SUCCESSFUL BRICK MACHINE.



WE have once drawn attention to the sterling merits of a new and improved brick making machine which has since met with uncommon, but not unmerited, success, and which is most justly entitled the *CHAMPION OF THE WEST*. From the satisfactory accounts we have received of the correctness of our judgment in its favor, we are induced to repeat our admiration of its efficacy and economy.

It does the mixing and grinding of the clay in the most thorough manner possible. It tempers it, moulds the brick and presses it, all with the one-horse power. Ten bricks at one revolution, or from twenty-five to forty per minute, are moulded by this machine, and in

such an excellent manner as to be highly desirable in building. So strongly is this *CHAMPION* constructed that it costs little or nothing for repairs.

We would wish to see its merits fully understood and appreciated, and we refer all interested parties to the manufacturer, J. L. HANNA, FRANKLIN, PENNSYLVANIA.

A NEW PAINT.—At a recent meeting of the French Academy, M. Sace called attention to the fact that tungstate of baryta forms an excellent white paint, which has as good a tone and depth as white lead, and has the advantage above this of not getting blackened on exposure to the atmosphere. Zinc white, which was tried as a substitute for white lead has failed, he said, through wanting body. M. Elie de Beaumont remarked that if this statement was confirmed, it would be of great importance; for there is no need to employ special mining operations for tungsten, as this metal is commonly found in company with tin.

PHILANTHROPIC.—The drinking fountain noticed in our preceding number, is one of several being erected by an Association instituted for that most laudable purpose in this city. Here truly is one of the palpable points of genuine Christianity.

AMERICAN INSTITUTE OF ARCHITECTS.

THE Report of the proceedings of the Second Annual Convention, held in New York on December 8th, 1868, just published, gives much interesting information to the profession and the public at large. We present here the Report of the Committee on Library and Publications.

To the American Institute of Architects:

Your Committee on Library and Publications, respectfully report:

That all papers and reports read in the last Convention of the Institute, together with the Minutes of its Proceedings, having been referred to your Committee for publication, your Committee met the next morning, and after electing its officers, made arrangements for the immediate issue of those documents. * * * * * The edition consisted of a thousand copies, two hundred and fifty of which are reserved without covers, while the remainder were distributed as fast as the limited resources of your Committee would allow, to members of the Institute, practising and honorary, to other architects, amateurs, prominent individuals, colleges, scientific societies, libraries, clubs, &c., throughout the country, and to the architectural societies and journals abroad. By several of these foreign journals, as well as by some of our own, the contents of these proceedings have been liberally quoted from.

Your Committee have also published a valuable scientific pamphlet, prepared by Mr. R. G. Hatfield, Fellow, on fire-proof floors.

The edition comprised 500 copies, 250 without and 250 with covers, 50 of the latter being placed at the disposal of Mr. Hatfield. Mr. Hatfield relieved your Committee of all expenditure of time or labor in the preparation and supervision

for the press of this important document. Your Committee have also published an abstract of some proceedings of the N. Y. Chapter, under the head of Occasional Paper, No. 1. Your Committee have likewise printed 2,000 copies of the Schedule of Charges adopted by the Institute.

A copy was forwarded to all the Architects on its Secretary's list, with the information that extra copies can be had at cost price rates. In adopting the system of selling instead of giving away, your Committee has been governed by their perception of the well known fact that, as a rule, people value most, whether on a large or small scale, what they have paid for. Seven hundred and seventy-five of these Schedules have been called for and sold. In accordance with instructions received from the Institute on June 2d, your Committee published the Constitution and new By-Laws of the Institute, introducing the latest information, and some improvements of arrangement into the accompanying list of members, officers, &c., and into the appendices—for the perfection of one of which (Extracts from the Law on Unsafe Buildings), according to the latest of the amendments of the Legislature, they procured documents from the Secretary of State. Your Committee was authorized to publish 500 copies of these new By-Laws. Of this number they ordered only 200 to be finished, reserving the major portion to be put together with the list of officers for 1868-9, and for any necessary correction in the appendices.

Taking into consideration the fact that differences of opinion on all subjects, and not least on those pertaining to building art and science, must necessarily exist among those who address themselves to others as authorities in their specialties, and being unwilling to

incur the charge of immodesty, by undertaking to endorse statements of which they are only the publishers; your Committee have passed a resolution that all statements contained in any publication issued by it, rest on the authority of the author only, and have instructed their Secretary to have said resolution printed on all future publications issued by your Committee.

* * * * *

With reference to contributions to your Committee for distribution, your Committee would remind authors that it is desirable they should furnish their Secretary with data, by which he may be enabled to avoid duplication, and to distribute the documents in the quarters where the specialties of which they treat will be best appreciated and best subserve the common cause. Some inconvenience and delay have already been occasioned by the omission of this very necessary information; and as regards all the issues of your Committee, it is hoped that the members of the Institute generally will do all in their power to lighten its labors of distribution. To this end they may contribute by furnishing your Committee from time to time with such reliable lists as they can make up of their clients, and of architects, amateurs, societies—artistic, scientific and literary—and public libraries, as well as by informing your Committee of changes of location; which, as we all know, are frequent in our community; our Secretary's list will thus be extended and corrected, and duplication and waste avoided.

The pamphlets and papers distributed by your Committee are enclosed in wrappers with the printed inscription "From the Committee on Library and Publications American Institute of Architects."

In its last annual report your Committee informed you as to its action in the matter entrusted to it by the Institute, of collecting for and forwarding to the Royal Institute of British Architects, in compliance with the official re-

quest of the latter body, a collection of photographs and other illustrative works of American architects. An appropriation was subsequently made by the Trustees for the purchase of such photographs as it was thought desirable to procure. The appropriation was entrusted to a Sub-Committee, and the illustrations collected by it were forwarded to London on the 3d of July last; they reached their destination safely, and were gratefully acknowledged by Mr. Thomas L. Donaldson, Honorary Secretary of Foreign Correspondence of the British Institute, under date of July 22d. As some of the members of our Institute furnished photographs of their designs at their own cost, it was found unnecessary to make use of the entire appropriation, and more than two-thirds of it was returned to the Treasury of the Institute. Since the last annual convention, your Committee have received through Mr. Ware, the three volumes of the "*Architecture Privée, au XIX^{me} Siècle, sous Napoléon III,*" presented to the Institute by Mons. César Daly, the author. This work they had appropriately bound, as also nine volumes of the publications of the Royal Institute of British Architects, presented two years ago by that organization, and five volumes of the Crayon.

Your Committee has also received, through the President of the Institute, a stitched sheet embracing a report of the Council to the annual meeting of the R. I. B. A., held May 6th, 1867; and from Mr. J. D. Labots, late of Amsterdam, Holland, they have received three plates of architectural designs by himself, and, through him, six plates of designs from and by Mr. J. B. Leliman of the same place.

* * * * *

RICHARD M. HUNT, *Ch'n*,
HENRY VAN BRUNT,
P. B. WIGHT,
EMLEN T. LITTELL,
ALFRED J. BLOOR, *Sec'y*.

DESIGNS, AND THEIR EFFECT IN EXECUTION.

DISAPPOINTMENTS frequently arise in carrying out certain designs which look exceedingly well on paper, often to the astonishment of committees, who advertise for, and afterwards decide on, competition drawings. It may be a matter of surprise to them as well as to amateurs in general; but that they are disappointed in their expectations of beholding models of taste and elegance in their preferments, is a common occurrence. The result probably happens through want of experience in contrasting drawings with their respective constructions, and ignorance in the application of truthful geometrical features to edifices; particulars, neither understood by the amateur nor the "practical man;" many designs which are prepossessing on this scale, grow displeasing on the full scale of construction, and when the deep shadows of every little break and panel almost disappear, or blend into the tone of the material used, the builder stares at the monotonous expression of his edifice.

There are, too, certain small matters scarcely ever taken into consideration, which render the best outlines displeasing, and sometimes make a wide difference between drawings and buildings; even wherein we may acknowledge the neatness of the former, in contradistinction to the slovenliness of the latter. One of these instances is, where the same color is given to stone or cement by the draughtsman; and again in execution, where one material by being painted is made to resemble another. Such deception produces many failures, as may be observed in façades, where cement capitals surmount stone columns, and ornamental members in any kind of foreign composition are mixed up with stone for the sake of cheapness.

A brick building cased with stone, is perhaps required for a public institution.

From the fifty designs sent in, the committee without partiality, may select one of a quadrangular form, or rather laid out in three sides of a square; with a tetrastyle porch on each flank, and a hexastyle one on the principal front for the sake of distinction. The drawings also recommend the choice, finished with accuracy; and every little break and minute line of moulding being well marked and deeply shadowed, the design shows an elaborate variety, and a pleasing union of art with novelty. Thenceforward it is forced on the approbation of the public, who patiently await the result of the undertaking. The edifice is finished, but does not produce the admiration expected. It turns out to be a plain stone building with the usual number of common place windows. What was intended to be a cornice appears a simple string; the flimsy mouldings on the capitals cannot be seen, and the imaginary pilasters altogether disappear from the surface; and, at the distance of three hundred yards, this colossal building, which cost the community so much money, does not show one-tenth part of the features exhibited on the drawings, resembling an asylum built for a needy incorporation in indigent times, instead of an institution erected by wealthy and benevolent citizens.

The committee should not allow themselves to be misled by errors, arising from want of judgment while there are architects in this country to whose decision an appeal can be made.

AN APOTHEGM.

"The Architect who raises in the air
Enormous structures, massive, grand, and fair,
Leaves to the world the genius of his mind
And is a benefactor to mankind!"

ANDREW PARK.

Oh! Andrew Park, your apothegm is rare,
For few, indeed, the mighty truth would find,
That those who build their castles "in the air,"
Become the benefactors of mankind.

P. De T.

PARISIAN PROMENADES.

IN the ensuing volume we will commence the continuous notice, with illustrations from the original, of a publication which must command the attention of every one of taste in this country. It is entitled *LES PROMENADES DE PARIS*, and is the only illustrated description of the Empire City of the world of Art and Fashion, giving all those magnificent works of Architecture, which decorate the streets and boulevards, as well as all the art displayed in the public gardens of Paris. The work will be completed in two superb folio volumes, one of text accompanied by choice vignettes, and the other filled with steel engravings and chromo-lithographs, by A. DE BAR, LANCELOT, RION, WEBER, J. GAILDREAU, FAQUET, LAMBOTTE, FREEMAN, PIZETTA, and numerous others, forming a corps of artists capable of carrying out any art enterprise. The second volume of *les Promenades des Paris*, will be an album in itself. This grand work will be issued in sixteen parts. It is conducted by A. ALPHAUD, Chief Engineer of the Imperial Corps of Bridges and Highways, &c., &c., and is published by J. ROTHSCHILD, Editor, 43 Rue Saint André des Arts.

EXTRAVAGANCE IN ORNAMENT.—The modern styles introduced from Europe, where they have been resurrected from intended oblivion, are but too apt to lead young architects into a very senseless display of embellishment, so overdone as to detract from any merit their design may intrinsically possess. It was this very spirit that led on the designers of the olden day from bad to worse, until at last their works were so encumbered with would-be flowers of art that they came to display vast collections of rankest weeds which flaunted over their façades wherever they could find a place.

TUDOR ARCHITECTURE.—“Henry the Seventh's policy,” says the English historian, Hume, “when he came to the throne, consisted in depressing the barons, and elevating and promoting men of new families, who were more dependent on his will. The nobility therefore now, instead of vying with each other in the number and courage of their retainers, which had hitherto been the case, by degrees acquired a more social and laudable emulation, endeavoring to excel in the splendor of their mansions, stables and equipage; while the common people, no longer retained in vicious idleness by their superiors, were now obliged to learn some calling or trade, thus becoming useful both to themselves and to the State. Henry the VIIIth was himself a great builder, and with him, and not at the dissolution of the monasteries, began that style of domestic architecture which continued till the reign of Elizabeth under the title of the Tudor, and which still retained, in a slight degree, the embattlements and other features of defence of the early feudal mansions.”

FIRES PREVENTED.—In Japan they have a very effectual plan for the prevention of fires; and, as prevention is far better than any efforts at extinction, it is to be hoped that the example set by our friends the Japs may become pretty general. It is simply this:

“Every one with whom, or in whose house a fire originates, whether accidentally or not, shall be decapitated without any appeal.”

That idea of making the head of the house responsible by such a process is rather cutting, but very conclusive; for, few fires would occur in case it was made the rule here where heads count. What say our insurance offices?

METHODS OF FINDING WATER.

THE location of water is one of those questions which concern most men, but none more intimately than he who seeks his comfort in a country place where he proposes to erect a homestead. The search for water has always, in ancient, as well as modern times, been one of very great interest, and has given rise to much debate as to the truth of certain systems of divination founded on the principle that willows and other trees that flourish best in wet places have such an affinity for water that a rod of any of those, if held loosely in the hand, will, when borne over the location of a spring, dip towards the ground. We will now give the methods recommended by Vitruvius, and much followed by the ancients.

"It is," says that observant writer, "easily accomplished if the springs are open and flowing above ground. If that be not the case, their sources under ground are to be traced and examined. In order to discover these, before sunrise one must lie down prostrate on the spot where he seeks to find it, and with his chin placed upon the ground and fixed, look around the place; for the chin being fixed, the eye cannot range upwards farther than it ought, and is confined to the level of the place. Then, where the vapors are seen curling together and rising into the air, there dig, because these appearances are not discovered in dry places. We should also consider the nature of the place when we search for water. In clay, the vein of water is small, the supply little and not of the best flavor; and if in low places, it will be muddy and ill tasted. In black earth, only trickling in small drops are found, which, collected from the winter rain, subside in compact hard places, and are of very excellent flavor. In gravel, the veins are small and variable, but they are exceedingly well

flavored. In the strong, common and red sands, the supply is to be depended on with more certainty, and is of good taste. In red stone, abundance and that of good quality may be obtained, if it do not filter away and escape through the pores. At the feet of mountains, and about flinty rocks the supply is copious and abundant; it is there cold and more wholesome. In champagne countries, the springs are salt, gross, tepid, and unpleasant, except those, which percolating from the mountains beneath the surface, issue forth in the plains, where, especially when shadowed by trees, they are as delicious as those of the mountains themselves.

"Besides the above signs for ascertaining in what places water may be found are the following: When a place abounds with the slender bulrush, the wild willow, the alder, the withy, reeds, ivy, and other plants of a similar sort, which neither spring up nor flourish without moisture. For these plants usually grow about lakes, which, being lower than the other parts of a country, receive both the rain water and that of the district through the winter, and, from their size, preserve the moisture for a longer period. On these, however, we must not rely. But in those districts and lands, no lakes being near, where the plants in question grow spontaneously, there we may search. In places where these signs do not appear, the following plan must be adopted. Dig a hole three feet square and at least five feet deep, and in it, about sunset, place a brazen or leaden basin, or larger vessel, if one be at hand. It must be rubbed over with oil inside and inverted, and the upper part of the excavation is to be covered with reeds or leaves; on these the earth is to be thrown. On the following day let it be opened, and if the inside of the vase be covered with damp and drops

of water, water will be there found. If the vase placed in the pit be of unburnt clay, having been covered as above directed, when uncovered it will be damp, and perhaps destroyed by the moisture.

"A piece of wool being placed in the same pit, if, on the following day it be not exhausted, but still retain unconsumed some of the wick and oil, and present a humid appearance, it shows that water will be found there, inasmuch as heat invariably draws the moisture towards it. Moreover, if in such places a fire be made on the ground, and the ground, when heated, throw out cloudy vapors, water will be found in it.

"These experiments having been made and the requisite indications being manifest, a well is to be sunk on the spot; and if the head of the spring be found, many other wells are to be dug round about it, and by means of under-cuttings, connected with it so as to concentrate them. The spring-heads, however, are chiefly to be sought in mountains and northern districts, because, in those situations, they are generally sweeter,

more wholesome, and more copious, on account of their being sheltered from the rays of the sun, of the trees and shrubs in those places being in greater abundance, and of the sun's rays coming obliquely on them, so that the moisture is not carried off. Valleys in the midst of mountains receive a very large proportion of rain, and from the closeness of their woods, as well as from the shade the trees afford, added to the snow, which so long remains on them, allow it to percolate through their strata, and thus arrive at the foot of the mountain, when, issuing forth, it becomes the source of a river.

"On the contrary; in a champagn country, much water will not probably be found; or if it should, it will not be wholesome, because the great power of the sun, unobstructed by shade, attracts and carries off all humidity from the plains; and were even the water to appear, the air would attract and dissipate the lightest, subtlest, and wholesomest parts, and leave the heaviest, most unpleasant, and most unwholesome in the spring."

SHUTTER FASTENING.

A VERY simple, yet highly practical invention has been laid before us, in model, by the Patentee, Mr. JOHN H. PETERSON, of this city. It does away with the barbarous finger pinching bolt, and secures the closed shutters to the meeting rail of the window. The action is that of pressure on a spring kneeler-latch, screwed to the shutter, which catches in a stop-plate screwed to the under side of the meeting rail of the sash. It is much more difficult to pry open this fastening than the old fashioned bolt; for, the shutter is held firmly to the window and cannot be opened except by pressure from within.

These fasteners are a neat piece of furniture and can be silver-plated, bronzed,

or of brass. They may also be economically made of lacquered ware. In a city like this where outside shutters are a part of our unchangeable institutions, any improvement on that feature is desirable, and we would say, that this fastener is very much to be commended.

ERRATUM.—In the article on "Warming and Ventilation," at page 723, right hand column, the word "water" should have read "steam," as will be evident. The sentence as corrected, reads "Look at the difference, let any one taste hot water of 140° F., or let him inhale hot steam of that temperature; try it with a thermometer; and he will suffer a painful ordeal."

A RECENT VISIT TO POMPEII.

A CORRESPONDENT of the *Continental Gazette*, published at Paris, gives the following highly interesting details of a visit to the exhumed city, which presents such fresh and bright observations and passing thoughts that all our readers must feel interested in them. He writes:

NAPLES, *April 12, 1869.*

My visit to Pompeii was so interesting that I have concluded to prepare a short narrative of it:

I rose one morning to see Vesuvius under the dawning day. From the sharp cone that formed the lofty summit the white smoke was ascending in masses which widened and rolled in, the one upon the other, as they floated off to the sky. The evening preceding my visit the intermittent flashes of flame from the top and the girdle of fire, which the mountain wore upon its side facing Naples, made it look terrible. But in the morning and all through the day the smoke curled upwardly in wreaths soft and graceful, as though it were a volume of incense from an altar of thanksgiving, while the sunshine hid the ruddy glow of the lava beneath its more brilliant splendor. After breakfast, carriage and guide being ready at the appointed time, we started for Pompeii. Mile after mile through the city, along the crowded and jammed and piled up streets, great rows of shining and flashing houses on either side, and between them such a packing together of donkeys, mules, vehicles, and all sorts, sizes, and shades of people; screams, yells, shouts, and all other outbursts of sound possible here and impossible everywhere except here; every driver cracking his whip so as to outdo every other driver; a menagerie of goats with bells, and asses braying at the highest pitch of possibility; a run-mad bedlam of itinerant pedlars and beggars

drumming on their chins and chaunting their beseechings for money, and Punch in his paradise, and drums and horns; this was our ride through the gayest, wildest, motliest, and withal, the most picturesque city on earth. The whole population seemed to have turned out of doors; families were keeping house in the streets; women knitting, sewing, and washing in the streets; blacksmiths, and all kinds of workmen at their trades in the streets, the whole making an uproar and a tumult on a scale of facetious variety inimitable, which, like the many-hued sky and landscape of Naples, once seen, lies in the mind undisturbed for ever. Through these long avenues of people we gradually passed into thoroughfares more quiet. But the great shadows of Vesuvius hung over us all the way, relieved, however, by smiling fields and the sunny surface of the beautiful bay; the former fringing its graceful slopes, and the latter curving around its majestic base. When we left the carriages, obtained our tickets, and passed within the entrance that led to Pompeii, the sudden change to silence and solitude was like leaving one world for another. Pompeii lies about thirteen miles from Naples. Its situation must have been surpassingly fine, the luxuriant plains stretching off on two of its sides, the river Sarnus flowing through its midst, and the sea, loveliest of seas, near by with its caressing waters. Vesuvius was but five miles distant. The city, indeed, was built upon a bed of lava which the mountain in some remote age had poured forth. Yet the volcano had been quiet so long that no one feared it; and as the position of the city offered unusual advantages to trade, as well as presented the highest attractions to culture and taste, it early became the resort of wealth and luxury. Although a Roman city, Pom-

peii belonged to that portion of Italy called Magna Grecia, and its peculiarities were largely shaped by the spirit of Greek civilization. It was visited by an earthquake, A. D. 63, and overwhelmed by an eruption of Vesuvius in the year 79. For nearly 1,700 years it lay buried under ashes. Since 1755 the work of excavation has been going on, though not regularly. It contained about 25,000 inhabitants. Its walls, which were twenty feet thick and the same height, were, I should suppose, rather more than two miles in circuit. These walls had five gates; the principal one was called the Gate of Herculaneum, and stood at the point where the Appian way touched the city. My first walk was along the Street of the Tombs. This is outside of the wall, and leads to the Gate of Herculaneum. I felt very strangely when I entered the House of Diomedes. If you have read the "Last Days of Pompeii," by Bulwer, you can understand why my feelings were so singular. To take a stroll through an almost perfect Roman House; to see all its arrangements; to tread upon its marble floors; look into its bed chambers, and stand in its reception hall; to go down into its cellars, around its gardens, and among its baths, is one of those intensely vivid things that the distant past rarely permits you to enjoy. I entered through a narrow passage (vestibulum) into the hall (atrium), and thence into the bedrooms, connected by doors with this hall. The chambers were quite small—not larger than the little dormitories in an old college—and they had no windows. I saw the other apartments. It was a sort of double house—one set of rooms for summer and one for winter. Like most of the private edifices, it was but one story. The wine-cellar below was quite large. A black wall surrounded three sides of the area, within which was the gardens. Down in the gloomy cellar I was shown where skeletons were found huddled together. The ashes swept in on the

inmates of the house, who probably hurried to that place for protection, but the mighty rain, black and tempestuous, chased them there and closed compactly around them. The impression of the skeletons is pointed out. But it is not as clear as that of the comic mask in the theatre of Herculaneum. I never saw anything more perfect than this. The melted lava caught it and hardened around it, and there are the mimic features all complete! Then I crossed the street and saw the family burial ground. Then other places of interment. The Romans loved to put their tombs on the sides of the public roads. Hundreds of these sepulchres may be seen in Italy. I went into these hill-side vaults. The urns were there containing the ashes. I saw a place sealed up, and on the marble face the names of children engraved; and I thought of the time, long ago, when in the morning twilight their fair forms were burning under the waving cypress. Outside the gates are various objects of an interesting kind that illustrate Roman life. Cicero's villa, so called, is in this street. The pillars are in the same style of so many of the buildings seen in old Rome—two rows of very thin bricks and then a block of "tufa," which is a volcanic rock. Not far off, is a semi-circular edifice, a line of rock seats within, which was used by travellers who chanced to remain without the walls at night. Close by is the house for guards. The sentry box is also standing. Passing these you reach the Herculaneum Gate, which has a central archway twenty feet high and fifteen feet wide. Through this you enter Pompeii. It is Pompeii still, so natural, so life-like. The long streets shine in the sun; the houses stretch away in regular lines; the walks ring freshly to your steps—Pompeii yet! But in a few moments you realize all—the ghostly form and the pale blanched look and the hushed stillness—a city lifted from its huge sarcophagus, its burial sheet unwound, and the miracle of the resurrection be-

fore your eyes, clear, bold, startling—Pompeii dead but living again. Is not this the wonder of the age? And then I wandered on, half awake and half dreaming. The streets are very narrow, many of them being mere alleys. How vehicles passed in most of them I was unable to see. But they are finely paved. The blocks used for this purpose are generally about the size of a barrel head, and are firmly embedded in the ground. In the more frequented parts of the city these blocks bear the marks of wheels, and between the curbstones that line the footways on the sides there are raised stepping-stones at the intersections of streets, on which foot passengers crossed. The names of these thoroughfares are quite characteristic—such as Mercury, Fortune; and judging from their appearance, I should infer that they were laid out with special reference to drainage and cleanliness. Sewers and culverts are still visible. Such care for health and comfort must have been required not only by the warmth of the climate and the danger from malaria, but by the densely crowded houses which must have occupied all the available space. The shops are quite diminutive. Most of them are neat little band-boxes in comparison with our stores, yet always strongly built and conveniently arranged. I saw a baker's shop, in which the mills for grinding are still standing, and at one end of the room, a bake-oven as much like a Dutch oven as Holland or Pennsylvania could show. A shop for the sale of wine and oil exhibits the counter containing large bottles or jars, while at the side is a range of shelves used for glasses. Loungers at these places must have been poorly accommodated. But the habit of the Pompeiians was to lounge in the sunshine and open air. Evidently they were an outdoor people. The dwellings are generally houses, not homes, or at least not homes as we understand the term. Those domestic arrangements we consider so essential to the privacy of individual

members of the household were foreign to their habits and tastes. Family life as such seems to have been confined to common wants and very simple conveniences. Where wealth allowed it, provision was very fully made for company, though the number of guests entertained on any one occasion must have been small. Among the largest and most showy houses are those of Sallust and Pansa. The former taking its name from the inscription C. Sallust, M. F., on the outer wall, covers a surface estimated at forty yards square, while the latter, including the space of the garden, occupies an area over 300 ft. by 121 ft. In all this class of mansions the atrium is prominent. Decorative art is never wanting for its adornment. A few feet from the walls that bound the inner line of the chambers and private-rooms pillars are generally seen, and in the centre of the tessellated pavement, lying within the ornamented columns, is a marble reservoir for water (*impluvium* or *compluvium*). Over this basin the roof was open, though it might be closed by an awning. Beyond the atrium are other apartments connected with a colonnade, among them the eating-hall and the picture-gallery. Frescoes are very commonly seen on the walls. Statuary abounded in these miniature palaces. Elegant tastes, whose memorials are still fresh and beautiful, appear in painting and other forms of embellishment. At every turn mosaics meet the eye. I saw a shell-work grotto that was very striking. Fronting the little garden at the rear of the house, its arch, fountain, basin, were elaborately finished in the best style of art. On the pavement of the vestibulum you would sometimes see "*Salve*," "*Ave*," in large letters of mosaic work, and on the floor of the "*Tragic Poet's House*" I saw the place where the mosaic of the Dog had been found. On a subsequent visit to the Museum, I took a special interest in this dog. By no means a handsome dog, nor is the mosaic fine; but "*Cave*

Canem," in good large letters under the animal gave me, together with his chain and look, a bad opinion of himself and a good opinion of his master, the "Tragic Poet," who doubtless thought that dogs ought to be banished from tragedy. On the whole, these houses would not have suited either your taste or that of the present age. The cold floors, the absence of chimneys, the substitution of the brazier for the hospitable hearth would not have accorded with your notions. I am of the same way of thinking. If we had been Pompeians, we should have undoubtedly boarded with the baker who had a big chimney and a big bakeoven. But to see the genius of Pompeii one must see the public edifices. Everywhere in them, the Roman idea of vastness, strength, and endurance is plainly visible, while, at the same time, the ornamental figures, such as the Bacchantes and the Fauns and the frescoes of arabesques, show the dominance of the Grecian taste. Around the Forum most of the temples are situated. Here are the temples of Jupiter, of Fortune, of Venus, and also the Pantheon and the Basilica. And grand they must have been, with their courts and statues, their pillars and porticos, for they are grand even now as ruins. Some of the altars, with their panels of carved figures, are surpassingly fine. As I walked around them, or leaned upon their marble slabs, now bare and cold, and read their inscriptions, it was an hour for the vivid recall of those facts which these symbols suggested. The whole scene at this point was most suggestive. Situated at a distance of 400 yards from the Herculaneum Gate, the Forum commanded a brilliant view of Vesuvius and the Apennines, while near at hand broke the incoming waves of the finest bay in the world. Slopes and plains; terraces that nourished the fruitful vine; fields where nature was prodigal of all her choicest gifts, and art was equally lavish with her magnificence; all lay as a gorgeous outspread before and

around. Through what an atmosphere, so soft, so clear, so transparent, these things were seen, and over all what a firmament bent with its arch, varying in hue from horizon to zenith, and shedding down upon land and sea the same changing tints of splendor, no one can ever know unless he has stood as I stood in winter on this spot, and has seen for himself the most resplendent panorama that the earth presents. But the hours were passing too fast for quiet contemplation, I saw the baths, each apartment almost perfect, the series of cold, tepid, and steam baths giving a complete view of the arrangements. Then to the theatre (tragic) which accommodated 5,000 persons, and less injured than other buildings; then to the comic theatre close by; then to the great amphitheatre, holding 10,000 spectators. This is the third amphitheatre I have examined, and in some minor details differs from the others. After this tour I glanced at the barracks, a large enclosure, 184 ft. by 137 ft. One thing of leading interest only remained, and this was the process of excavation. The depth of the dirt which buried the city is from twenty to twenty-five feet. It is of a dark gray color, and is rather like fine gravel than ashes. It pulverizes easily; not much effort seemed necessary for its removal. Along the level plain, resting upon the unexcavated part, a simple railroad has been constructed, by which the dirt is carried off. Only about one-seventh of the city has been disinterred. How would you feel if you stood on a plain of green grass and looked down into rooms and halls with frescoed sides watching a column as it rose into the light lost 1800 years ago, and seeing the marble tables around which beauty and talent and wit used to gather, lifted up and out into a recovered world? How would you feel if you beheld every sort of domestic article—common implements, furniture, kitchen utensils, toilet bottles, candelabra, vases, jewelry, all dug up by spade and shovel? And then skele-

tons of men and women once here, and once proud, happy, content with the fugitive hour and heedless of the dark and dooming to-morrow? I saw four skeletons lying under glass covers (found some time since), and supposed to be a family overtaken by destruction in their own home. Are they father, mother, and two sisters? Whether so or not, I never saw the human outline wear such an aspect of terrible tragedy. The uplifted arm, the palm of the hand heavenward; and the figure of one of the girls, her face down and leaning upon her left wrist; nothing I had previously seen gave me such a profound sense of the awful calamity that had hurriedly swept Pompeii out of existence. Strange that the ashes which entombed the city should have preserved it so perfectly. Did ever

Egypt embalm like this? The huge mummy, how well it was shrouded and laid away in its sarcophagus! And here is its form unwrapped—the winding-sheet is off, and the pale spectre looks up and confronts the Mount of Fire, under whose quick, scorching, tumultuous blasts, its life, trade, homes, temples, religion—its many sins and sorrows—its gaities, and hopes, and brightness—all were sepulchred together. The old heathen faith, all unawares to itself made fearfully true at the last—the consuming flame of the funeral altar—and Vesuvius the mighty torch-bearer, to ignite the sacrifice! But there were no chaplets, no incense, no lamps, no sprinkling of mourners from the laurel branch, no “*Ilicet*,” no “*Salve Eternum*.”

ANCIENT AMERICAN ARCHITECTURE.

THE system of railroads is now rapidly bringing nearer and nearer to us the wonders of art as well as nature, of which we have been hitherto content to read, but of which a very limited number have had the courage or perseverance to know anything intimately. We travel to Europe and into Asia and Africa, to look at the renowned monuments of ages past; while those of our own continent are barely known to exist—and even that little item of knowledge is just now but thirty years old.

It is true the difficulty lay in the absence of almost all facilities of travel. But, now that the Pacific is united by rail to the Atlantic, we may look with full confidence to the connection at no very distant day of Central America with our States. We do not mean annexation, of course, but simply a making easy the present *plena labores* which beset the art student who dared that region for architectic lore.

On the southern margin of the Gulf of Mexico is the province of Yucatan, in and near to which the magnificent remains of ancient American architecture were found to exist.

President VAN BUREN, in the autumn of 1839, sent Mr. J. L. STEPHENS, a gentleman of talent and education, on a mission to Central America, on the fulfilment of which he was authorized to travel through the country and make researches into that *terra incognita*. Mr. Stephens was accompanied in his travels by Mr. CATHERWOOD, the artist, and although the country was at that time suffering from intestine broils which rendered travelling not a little dangerous, yet did these two adventurous gentlemen manage to effect a journey of three thousand miles in Chiapas, Yucatan, and other districts in Central America whose names alone were known at that time in Europe and the United States, but from which places we are now in constant receipt of news.

Mr. Stephens collected a large amount of descriptive information, and Mr. Catherwood made a considerable amount of drawings of the buildings discovered. In the summer of 1841, Mr. Stephens published the result of his journey under the title "Incidents of Travel in Central America, Chiapas, and Yucatan."

The details of these discoveries were received with astonishment, as few of our most devoted students of antiquarian research were prepared to hear of the existence of such buildings, even in ruins, as were here described by pen and pencil.

The thirst for exploration at once began, and in the autumn of 1841, immediately after the publication of his book, Mr. Stephens, accompanied by Mr. Catherwood, once more set out to review the wonderful region they had so interestingly described.

These kindred spirits roamed over an immense extent of country and visited forty-four ruined cities, or at least places at which remains of ruined buildings were found. Even the inhabitants of the City of Mexico, itself, were wholly unaware of the existence of any such remains as those now discovered by our investigating countrymen.

In 1843 Mr. Stephens published the result of this second series of labors in his "Incidents of Travel in Yucatan;" and in 1844 Mr. Catherwood gave to the world a splendid folio volume of tinted lithograph plates, representing the chief among the objects explored.

These published discoveries made a vast accession to the knowledge we had just acquired of the wonderful people who inhabited this now dreary waste, and likewise drew attention to the surprising similarity between the architectural monuments of ancient Egypt and these now brought to light on our continent. Several years before the discoveries in question, a writer who had described some of the Mexican monuments remarked: "The first and strongest conviction which will flash on the

mind of every ripe antiquarian, whilst surveying the long series of Mexican and Toltec monuments, is the similarity which the ancient monuments of New Spain bear to the monumental records of ancient Egypt. Whilst surveying them, the glance falls with familiar recognition on similar graduated pyramids; on similar marks of the same primeval Ophite worship; on vestiges of the same triune and solar deity; on planispheres and temples, which though characterized by some distinctions, entirely American, are not less worthy of the notice of the Egyptian antiquaries; on relics of palaces at once noble in their architecture and beautiful in their proportions and decorations; on monuments sepulchral, domestic, religious, or warlike, which deserve the designation of cyclopean as much as any that are now extant in Italy or Greece; our idols and sculptures, some of rude and some of finished workmanship, exhibiting different eras of civilization, and often presenting the most striking affinities with the Egyptian, yet distinguished from it by characteristics perfectly American."

The researches in Yucatan have rendered yet more evident the existence of a style of art in ancient Mexico, interesting alike for the analogies which it presents to that of Egypt, and for the points of difference between them.

One of the most remarkable buildings which Mr. Catherwood has illustrated, is now called, in the Spanish of the country, the "Casa del Gobernador," or Governor's House. It is situated at a place called Uxmal. This building is constructed entirely of hewn stone, and measures three hundred and twenty feet in front, by forty feet in depth; and it has a height of about twenty-six feet. It has eleven door-ways in front, and one at each end. The apartments within are narrow, seldom exceeding twelve feet in width. But some of them are sixty feet in length, by more than twenty in height. These chambers have no

windows and present no appearance of decoration on the walls. The lower part of the building is of plain wrought stone, but the upper portion is covered profusely with decoration. So enormous is the quantity of surface thus carved in stone, that it amounts altogether to nearly eight hundred feet in length, carried round the sides of the building. Every room displays a singular kind of arch, which seems to have formed a principal feature in the architecture of the country. These arches are of a triangular form, constructed of courses of stone, each of which projected beyond the one beneath, until the aperture in the middle became sufficiently small to be closed by a flat stone at the top. This is exactly the same kind of arch as is believed to have been the forerunner of the true or keyed arch in Greece and Rome.

In the building at Uxmal the lintels of the doors were of wood, which has so far decayed as to cause the fall of the masonry which they supported. There is a sculptured cornice going entirely round the top of the building, on all four sides.

This Casa has a very imposing appearance, owing to the lofty terrace on which it is built. There is in the first place a platform about three feet high; and, fifteen feet within this is another platform about twenty feet high; two hundred and fifty feet within this is another platform also about twenty feet high, and on the uppermost platform the Casa is built. Within about sixty feet of either end of the building are arched gateways, of which the masonry is similar to that of the rest of the building.

Of another of these interesting buildings, the palace at Palenqua, Mr. Catherwood remarks: "It stands on an artificial mound whose base is three hundred and ten feet by two hundred and sixty feet, and forty feet high, with staircases on the four sides. The building itself measures two hundred and twenty-eight feet by one hundred and eighty

feet, twenty-five feet high, and is of one story. The front and rear have each fourteen doorways, and eleven at each end. The piers dividing the doorways still present traces of admirable stuccoes, which were painted. The interior is divided into three court-yards, with a tower in one of them. Every part appears to have been elaborately decorated with sculptures in stone, stuccoes, and paintings. In several of the apartments, which have the usual triangular arch, I noticed that the walls had been painted several times, as traces of earlier subjects were discernable where the outer coat of paint had been destroyed. The paintings were of the same nature as the frescoes of Italy,—water colors applied to cement.

"The other buildings are inferior in size to the Palace, but all on high mounds, richly decorated with numerous stone tablets of hieroglyphics, and sculptures of figures well executed, which have awakened a lively interest in the antiquarian world.

"In another place a building has been discovered, forming four sides of a square, and enclosing a court-yard measuring three hundred feet each way. Each of the four sides of the building shows a design different from the others, as also do the rear fronts and the ends; so that the buildings altogether present sixteen façades, all different, and all richly sculptured and painted, with all the details of the ornaments picked out in colors and in gold. The appearance of the building must, as Mr. Catherwood remarks, have been gorgeous in the extreme."

One of the strangest features connected with these ruins is, that they are often buried in the depths of a forest, where they almost escape human eyes. Thus Mr. Stephens, travelling along with his companions on horseback, encountered an immense mass of building in the following way: "After proceeding a mile and a half," he says, "we saw at some distance before us a great tree-

covered mound, which astonished us by its vast dimensions, and, but for our Indian assistants, would have frightened us by the size of the trees growing upon it. The wood commenced from the roadside. Our guides cut a path, and clearing away the branches overhead, we followed on horseback, dismounting at the foot of the Casa Grande. It was by this name that the Indians called the immense mound of white stone buildings which, buried in the depths of a great forest, added new desolation to the waste by which they were surrounded. We tied our horses, and worked away along the front."

The building which the party thus discovered in the depth of the forest is an immense and remarkable one. It consists of a kind of a palace three stories or tiers in height. The lowest range has sixteen door-ways, opening

into two apartments each. The second range has numerous door-ways supported by pillars, and also stair-cases to lead up to the third range. It forms in fact a sort of triple palace, for each of the three parts is built as a terrace constructed above the part next below it. This building is not so remarkable for the richness of its decoration as some of the others, but is well calculated to excite surprise and interest from the situation in which it was found.

Many of the door-ways of the ruined buildings in Yucatan are enriched with sculptures, to an extent that can hardly be excelled in the older continent. The sculptures, it is true, often represent objects more grotesque than beautiful; but there are not wanting details of graceful ornament; and all of them seem to have been very carefully executed.

THE BUILDING ART.

CIVILIZATION presents no greater art than that of building. Man takes the materials nature presents him with, in mineral and vegetable, and, bringing the godlike power of his mind upon the question of his need, he fashions to his will the stone, the timber, and the metal, until, in combination, he produces a construction to suit, not alone his wants, but his taste.

The building art develops more trades than any other; in fact, it may be safely said that three-fourths of the occupations of men go to constitute that one great art of architectural construction whose development is so certain a proof of the refinement of a people. The invention of every age is taxed to make up the treasures which building displays; there is no cessation of effort; there is no tiring out the patient industry that ever studies and constructs, and in its very constructions finds still more food for

study. The theme is inexhaustible in itself; it is only the mind that wears out in the effort to exhaust it. In fact, building is a progressive art, whose state of refinement is termed Architecture, and which is continually drawing upon the imagination, and creating worlds of fancy to aid it on its perpetual course. Nature is its ally now, as she was its prime mover when necessity demanded its existence in the beginning; and with such an ally, ever ready with new promptings, how is it possible for the great art to die of exhaustion?

Each and every age was confident that invention in the art of building could not go much farther than their mental power, their genius had advanced it; yet we look back upon their efforts with a feeling of gratitude only, because we deem our own era still ahead. So will it be forever and forever, until the very world we seek to embellish shall itself

decay, and make of all one vast promiscuous ruin.

In the progression of this, our great art of building, every one, however humble, has his share of responsibility, from the moulder of bricks and quarrier of stone to the sculptor and decorator—from the artizan to the architect. Each is in a measure dependent on the other, and all are alike interested in the full and complete success of the work which they aid in or control. And when we consider the vast number of branches concerned in building we can alone come to form some tangible idea of its greatness and universality. There are those who would fain make little of it, and style it, in contempt, only “a mere trade;” but such creatures are the exceptions in civilized society, whose ideas emanate from brainless heads, and pass away on the wind, of which they are the lightest part.

The importance of the great building art is far beyond all rivalry, for in age, utility, and grandeur it exceeds all other aids to civilization; and if there be a proof required, it can be at once found in the fact that the highest and proudest in every land are solicitous of being worthy to be called a “Mason.” Some may suppose that Free-masonry has nothing to say to our subject; on

the contrary, it is one and the same thing, though it is true that the one is, in a strict sense, more practical than the other. But it was from that brotherly band that wandered from land to land and from city to city, designing and constructing all that art then knew in architecture, and bound together in the infrangible bond of well-cemented friendship, that the Masonic body of to-day had its origin; and every emblem and every word of wisdom which is used by it is derived from that fellow-craft that, received and welcomed into the most conservative of kingdoms in the earliest ages, under the title of FREE AND ACCEPTED MASONS, laid the imperishable foundation of the institution men love to honor under that very name.

Who, then, shall say that the ART OF BUILDING is not an important one, and at best but worthy of being ranked as a merely mechanical art?

Founded on PHILOSOPHY, reared up by TASTE, and dedicated to SCIENCE, its works shall endure as monuments of its existence and its importance.

Educated thought and experienced knowledge are necessary to pre-eminence in this art; wilful ignorance brings down upon those who would seek it as a means of livelihood both ruin and disgrace.

BUILDING IN NEW SOUTH WALES.

WE are in receipt of our files from Sydney, which will be continued regularly henceforth, so that our readers will be kept posted on the most interesting building news from that flourishing region. We here present an extract from the *Sydney Mail*, which, we have no doubt, will be read with pleasure by all who feel an interest in the great problem of progress which is now being so satisfactorily solved, even to the ends of the earth.

THE NEW GENERAL POST OFFICE, SYDNEY.

What the cathedrals were to every separate focus of civilization in mediæval times, and the forum to those mighty cities in Europe which flourished before the Roman Empire, are those *material centres* of activity and intelligence, now so happily distinctive of every metropolis,—without the existence of which, it is not too much to say,

the whole business of life would inevitably be brought to a most melancholy stand-still, and the social, political, and intellectual interests of the entire community be struck with sudden death, or most disastrous paralysis. Every General Post Office, in a modern State, or colony, is the diamond point, as it were, upon which the exquisite machinery of civilized life revolves with a rapidity and a precision which has almost preternaturally quickened the action of the human mind in all its functions; facilitating a constant and general intercourse between all members of the commonwealth—an intercourse proved to be the very soul of progress in all those arts that teach men to value life, and subservient to every enterprise for the moral elevation and mental improvement of mankind. To the results of that direct and steady intercourse which postal institutions have established, and to the obvious benefits thereby secured, may we not unreasonably attribute the increased desire for yet further opportunities of intercommunication, and the glorious triumphs which have been gained in this direction by the agency of the steam-engine and the electric telegraph—the full development of which, in a social point of view, are still very far from realized. Already those grand discoveries are made to act in concurrence with postal arrangements, to our great commercial and general advantage, both in this country and in the adjacent colonies. Every fibre of that vast network of intercommunication which spreads over Eastern Australia is concentrated in this maritime city; every telegraphic wire has here its ultimate limit, every railroad its practical terminus, every highway its common point of junction. By all of these, as to the living heart of the body, is a constant, healthful, circulation kept up; and the material centre at which those intellectual pulsations are sustained, quickened, and regulated, is manifestly the General Post Office at

Sydney. Such an important centre must, it is obvious, be one, in all respects suitable to its grand purpose—if all is to go on well—carrying on its multifarious operations in some large building, studiously adapted to every circumstance incidental to its action. It has been determined that such a building shall be erected, and there is every reason to believe that the General Post Office now being raised in George street, will, on its completion, be found to be such an edifice. A brief general description of this noble building, and of the present progress of the work will, we should think, be not uninteresting to most of our readers.

The foundations of this massive edifice—the total frontage of which, when finished, will be not less than five hundred feet—are, of course, of the most substantial and durable character, and were laid upwards of a year ago; that portion of the work being carried out by the late contractor, Mr. A. Loveridge. Upon these foundations the solid and beautiful superstructure (which confers the highest credit upon Mr. Barnett) is now being rapidly erected—with all its elaborate details, and in spite of all its peculiar difficulties—by the present contractor, Mr. John Young, under the anxious and unwearied superintendence of the Colonial Architect. Its entire frontage will be spanned by thirty-five arcade arches. In Pitt street the eastern front, nearly opposite the Metropolitan Hotel, will extend for seventy feet, and from the north end of that front it will run back for three hundred and fifty-four feet to George street, thus forming the southern side of a new street connecting the two principal thoroughfares of the city. From the western extremity of what (when completed) will be the great north front, the western front, facing George street, will extend for seventy-six feet (as far as Mr. Chisholm's) with an elevation of seventy-five feet from the pathway of the main street up to the topmost cornices. Be-

low the levels of the three above-named streets there stands a lofty and spacious basement story, giving accommodation to the mail carts—which are to enter the building from the new street connecting Pitt and George streets. The mails are to be brought, through archways, into a courtyard, where there will be every convenience for turning the vehicles, and for hoisting the boxes and bags, &c., to the delivery, sorting, and dispatch rooms on the first floor; provision being also made for a simultaneous reception and dispatch of mails. Here also, in the basement, are large and commodious apartments for the postmen and messengers; stables for the horses, and rooms for the stowage of boxes, and bags, &c. On the ground-floor will be the receiving and delivery departments, with rooms for the money order, telegraphic, and stamp-selling offices opening on to George street. On the first floor (as we have said) will be the sorting and dispatch rooms, together with the offices of the Postmaster-General, of his secretary, and of the superintendents of the now distinct departments, the money order office, and the electric telegraph office. On the second floor it is intended to provide for the clerical staff of the Post Office, and to have the operating room of the Telegraph Office. Storage for dead letters, general store-rooms, stamp printing rooms, and other accommodation, will be also found on the the third floor of this splendid building.

The first portion of Mr. Young's contract, as seen from George street and the proposed new street, is composed of grey granite, from the quarries of Moruya, opened for this purpose by the contractor, now, for the first time, introducing the use of this beautiful and durable stone as a building material. All these blocks of granite are of enormous size, weighing from five to as much as twenty tons each. The blocks supporting the principal piers, which face George street and adjoin the western an-

gle of the new street, are all of the most remarkable size, conveying a most vivid impression of the vastness of the structure they are intended to sustain. The remaining continuity of the granite blocks constitutes the line of entrance steps to the building, the contrast of the light grey granite with the warmer tint of the main walls of the edifice (of the very best Pymont stone) being extremely pleasing. Towards George street a number of the square piers of Pymont stone moulded with rusticated work are already built, and give some notion of the grandeur of the proposed building. On one of the granite bases facing the new street, one of the Moruya granite columns (beautifully polished by machinery at work night and day on the premises) was erected on the 21st instant, the day of the arrival here of H. R. H., the Duke of Edinburgh, last year. This *first* piece of polished granite ever produced in the colony is of exceeding beauty. It will be one of a range of ten columns, supporting a lofty arcade, which is to reach from George street half-way down to Pitt street—the limit of the present contract. Passing the broad line of granite, standing as a basement for the support of these magnificent grey columns—which end on the George street side only, at the yet more massive sandstone piers of the northwest angle—the attention of the visitor is first attracted by the beautiful finish of the inner wall of the arcade, the whole of the western portion of which (at the rear of the new street front) is now in its place. All along this massive wall, and from the same level, the springing of the cross arches is already shown. On these there will be coffered soffites with carved patera on each coffer, the carving of these details being executed by Mr. McGill, an artist workman, whose accomplished chisel has written his name in stone on some of the finest buildings in Sydney. From these cross arches the dome-vaulting of the entire arcade will rise. The

flooring of this arcade is to be laid on brick arches, but elsewhere in the building the floors will be supported by huge wrought-iron girders, manufactured by Messrs. P. N. Russell, of this city. In the court-yard behind, the walls of the edifice are carried up much higher than towards the street, where difficulty and delay have unavoidably been occasioned through having to prepare the blocks of granite. In the preparation of this splendid (but obdurate) material every appliance has been made use of that studious invention could suggest or practical science apply. A steam-engine is constantly employed for the purpose of polishing the granite pillars which are each of them to be formed of a single block. The rapid revolution of these cylindrical masses of granite, and the simple process by which they are slowly made to take a brilliant polish, is not the least attractive sight at the works—something that carries one irresistibly back to dreamy speculations upon the possibly analogous modes by which the ancient Egyptians performed similar gigantic tasks. The walls of the building throughout will be, internally and externally, of wrought stone, so that no plaster will be needed, and the greatest possible security be afforded against the calamitous effects of fire. Externally, towards the court-yard, there will be stone balconies supported on cantilevers, or corbels; and from these balconies, bridges will be made to span the court-yard, for the convenience of the officers of the various departments to be accommodated in this magnificent building. The arrangements for carrying on the works are admirable, but from the very nature of the work the masons are greatly inconvenienced for want of proper space in which to carry on their operations. It has been suggested that the eastern footway of George street, adjoining the building, might be widened two feet, by boarding over the stone gutter. This would enable the contractor to advance his present hoarding at least two feet

further towards George street, without narrowing the present footpath, or encroaching upon the roadway. Small as the space thus gained may seem, it would be esteemed a very great improvement.

The style of the new General Post Office is described as an adaptation of the Italian, in which the architecture of a Florentine palace has been judiciously combined with the light and arcaded façades of the Venetian school. In the western front, facing George street, there are to be three tiers or stories, in the construction of which will be displayed a modification of the "Corinthian." Here there will be three-quarter columns of Australian marble, with carved capitals, entablatures, cornices, mouldings, and other appropriate ornamental details. In the centre arch the royal arms will appear on the keystone, and the front will be yet further enriched with symbolical figures of commerce, science, literature, and art; a marble statue of her Majesty, and a variety of such other details as will add materially to the general effect. The northern front, as designed by the architect, is particularly chaste and impressive. The present contract will carry this façade half-way down the new street. The admirable stone of the Pymont quarries is being used for the building.

BEST TIME TO PAINT HOUSES.—Experiments show that paint on surfaces exposed to the sun will be much more durable if applied in autumn or spring than if put on in hot weather. In cold weather it dries slowly, forms a hard, glossy coat, tough, like glass; while, if applied in warm weather, the oil strikes into the wood, leaving the paint so dry that it is rapidly beaten off by the rain.

ANOTHER FOUNTAIN.—A philanthropic lady of this city has presented the thirsty with a fountain similar to that noted in our last. It is erected on Chestnut street in front of Independence Hall.

GEOMETRICAL DRAWINGS AND MODELS.

THERE are subjects connected with Architecture which are often overlooked, whilst others that are not of as lively importance are repeated again and again. In looking over the second volume of Loudon's Architectural Magazine, that pioneer in the serial literature of our profession published thirty-four years ago, we find an article so much to our purpose, the sentiments of which are so worthy of being perpetuated that we give it *in extenso*; although we would premise that models are seldom used now-a-days in this country. But this is more on account of their expensiveness than their inutility.

"Before a building is erected, the design for it must be shown in some manner capable of exhibiting what it is to be; and, if possible, what will be its precise effect when executed, so that there may be no after regret or disappointment. This is done by means of models, geometrical drawings, or perspective views. Geometrical drawings are indispensable, because neither models nor views can be made until the architect has so far shaped his ideas; but the other two modes of representation, especially that of models, are by no means in general use, and very rarely indeed are all three of them employed at the same time; yet in works of importance, it is quite essential that they should be, for to neglect doing so is a very mistaken species of economy, and sometimes occasions an expense very far exceeding the contemplated saving, since no one mode can by itself convey a complete idea of what the edifice will actually be, although, by having recourse to them all, we may prevent any possibility of being deceived.

"Even the model, which seems the most certain guide of all, and which has, at least, the advantage of being intelligible to those who are not conversant

with geometrical designs, may, if incautiously trusted, greatly mislead. It is, indeed, an exact representation of the building, but nothing more; there is no positive scale for the eye, so that either fancy or inclination may exaggerate its dimensions, and bestow upon it an importance the building itself will not possess. Sometimes, indeed, a figure is put in, to serve by way of scale; but even this will not entirely guard against delusion, because if the building is to be in the immediate vicinity of others, its height will be more or less affected by theirs. What may be exceedingly well proportioned in itself, and have a sufficiently dignified look when considered apart from any other object, may make a very different figure when it comes to be built. Feeling that it ought to have superior importance, and to display itself to the best possible advantage, people take it for granted that such will be the case; therefore it is no wonder if they afterwards feel something like disappointment, should they happen to find the structure itself, as will sometimes happen, look little better than an overgrown model, being much lower than the houses above which they fancied it was intended to rear its height. Even they who are aware that the building will not be so lofty as those on either side of it, do not always make due allowance for the difference; and the difference of effect so occasioned may greatly exceed that of positive measurement. Delusions of this kind might easily be guarded against, by having cardboard elevations of a part of each adjoining building, that may be fixed up against the model at pleasure. By way of further precaution, if the building is to be in a street, or in any other situation where the view of it will be limited to a certain distance, that distance should be accurately marked by scale, and a card, with

a hole in it, fixed at the natural level of the eye, so that the model can be seen through that aperture under precisely the same angle of vision as the building really will be. This would not at all hinder the model from being completely examined, or viewed in any other direction, as the card or board might be attached to a bent wire, made to hook on the model-stand whenever required. It may here be observed, that models are seldom placed properly, the consequence of which is, that we generally look down upon them as in a bird's-eye view, whereby much of their proper effect is quite lost. This defect might be remedied, and the advantage of being able to inspect the roof still secured, were the stands upon which models are placed so constructed as to allow them to be raised or lowered at pleasure, by means of a screw and winch handle.

"Another circumstance which renders it prudent not to trust too implicitly to models is, that they do not express color, particularly if executed in plaster. They flatter the eye by that brilliancy of decided and uniform white, which not even a newly erected stone building possesses; consequently they rather show a degree of beauty which is desirable, than one which is attainable; that is, what persons in general would consider to be such, although, in a painter's estimation, it would more frequently than not be considered a defect. Hence a model is apt very frequently to mislead the judgment; and, more especially, to impose upon those who delighted with it as a miniature resemblance, think that, because the model looks 'very pretty,' the building must of course look very beautiful. Unless the windows are real apertures, it is advisable that they should be colored of a tolerably dark hue, since, if that be not done, they will have the effect of blank windows, thereby occasioning an appearance of breadth and repose which the real structure cannot possess.

"In spite of these drawbacks, which,

by being known and kept in mind, are reduced to very trifling ones, models recommend themselves by decided advantages of their own, since they enable us to study every imaginable effect of light and shade, and of perspective. Besides which, a well-executed model is in itself a highly pleasing and ornamental work of art. All this, however, is to be understood with some qualification; for, if a design consists only of flat elevations, with no variety of outline, and no projecting part to fling shadows on others, the model would show little more than might be seen by geometrical drawings of all its fronts, and would be of little further service than that of exhibiting the form of the roof. In such cases, therefore, very cheap and expeditiously made models might be prepared, by drawing all the separate elevations, and pasting them on a hollow frame or box, and afterwards putting on a roof of pasteboard. The chief difficulty would be the cornices, for the projection of the other mouldings would not require to be noticed; yet these might be separately formed in wood or plaster, and then glued on and colored like the rest. Should there be occasion to show breaks in any of the elevations, the block must be shaped accordingly, and the divisions of the elevation pasted on separately: in fact even entire columns and entablatures in relief might be added, after as much had been done as conveniently could be by mere surfaces; yet this would hardly be worth while, for the time and cost bestowed upon it would almost equal that required for a perfectly executed model; whereas the facility of preparing them would be the chief recommendation of such sketch or block models.

"Having spoken of models, let us now consider the exclusive advantages possessed by geometrical drawings. Some more than ordinary recommendation they certainly ought to possess; for they find so very little favor in the eyes of most persons, that they will hardly

condescend to bestow the slightest attention upon them, unless it be for the showiness and beauty of their execution. It is to be hoped that the *Architectural Magazine* has done something towards removing a most extravagant prejudice against the ground plans of buildings, namely, that, if there be any interest at all in such drawings, the things are quite incomprehensible; whereas, so far from there being any mystery in them, a child of common capacity would be able to understand them, if properly, and of course, patiently, explained to him. Perhaps there is quite as much affectation or obstinacy in the case as any thing else; for it will generally be found that the persons who pretend they can make nothing out of a plan, possess, like M. Jourdain in the *Bourgeois Gentilhomme*, a talent quite unknown to themselves. If they can make out the meaning of a map, they understand what might reasonably be imagined by far the more unintelligible species of plan, because such geographical plans less clearly denote what is intended to be expressed by them than architectural maps do. Or how happens it, that the same unfortunate persons, who are bewildered at the sight of the ground plan of a house, are nevertheless gifted with such sagacity, that they are not at all puzzled by the plan of a city. Enlightened, perhaps, by some preternatural means, rather than informed by any natural exertion of intellect, they know, almost without having ever had occasion to be told it, that the dark parts indicate houses and other buildings, at least the ground upon which they stand. Yet show them the map of a house; inform them that the shaded parts indicate the walls, and show their thickness, while the blanks, interrupting the course of such lines or shadings, represent the doors and windows, and ten to one but they stare you very innocently in the face, and tell you they see nothing whatever like walls, doors, and windows; and, after having occasioned you to swear

sundry mental oaths at their stupidity, finish by exclaiming, "Well, it may be so, but I positively cannot see what it means; never beheld such odd-shaped doors and windows in all my life."

"Were I to protest that there is not the slightest coloring of caricature in the above, I might not be exactly believed; still there is so very slight a tinge of it, that the matter is hardly exaggerated at all; for, if you can get on so far as to make persons at length understand those particulars, there are a hundred others which you fruitlessly endeavor to explain to them. They will tell you, for instance, that what you call stairs, are "all flat," and lying on the ground; and, when informed that the dotted lines are intended to show the projection of cornices, and the compartments of the ceilings, ask how it is possible that the ceiling can be upon the floor.

"These remarks, it must be owned, appear to have very little to do with the subject itself; nevertheless, they may possibly be of as much actual service as all the rest of my article put together, by leading persons to consider whether it would not be proper that children should be taught to understand the nature of architectural plans, as well as of other plans or maps. But to resume what I have thus interrupted by a long *par parenthèse*: a plan may be defined to be a horizontal section of a building, or of any particular floor of it; and it is highly desirable that it should be made to show whatever can be expressed in it, without crowding it so much as to be confused. In this respect, many of the plans given in architectural works, the older ones more especially, are sadly deficient; and this is most felt in the case where they are not accompanied by sections. The projection of cornices, the compartments of ceilings, the groins of vaulted roofs, domes, skylights, &c., should all be transferred to the plan, and indicated on it by fine dotted lines; also the shelving in libraries, and

the windows, if at a considerable height above the floor; in both these instances the parts being slightly shaded, otherwise, in the one case, the windows would appear to be at the usual height, and, in the other, the lines intended to show the projection of the shelving from the face of the wall would not clearly define the actual area of the floor. Should parts of the same plan or floor happen to be on different levels, they should be distinguished, as they easily may be in drawings, by making the whole lower part of a rather darker tint, in proportion as the difference is greater or less. When this is not attended to, it sometimes becomes impossible to feel quite certain as to the plan, for we may mistake the descent of steps for an ascent, or *vice versa*. At any rate, the mode above recommended has many advantages on its side, because it clearly indicates the circumstance at the first glance, keeps it in mind, and shows the exact extent of each level. Supposing the plan to be that of a theatre, there may be three, four, or even a still greater number of planes in the same drawing; and, although this should be sufficiently understood when examined, it is as well to render it apparent to the eye at first sight.

"Differences of height ought also to be expressed, as well as those of level, whether they occur in separate rooms, or in the separate divisions of the same room, because such difference is one great source of variety and contrast, and much of the effect and character of the apartments will depend more or less upon this circumstance; consequently it is one which should not be suffered to escape notice in the plan. Where all the rooms upon a floor are precisely alike as to height, it will be sufficient to state once for all what that measurement is; if not, the respective altitudes should be denoted by figures, and a small *h* placed before or after them. Besides doing this, the same mode may be had recourse to for rendering apparent the

greater loftiness of some rooms than others, as that which has been pointed out for distinguishing such parts of a plan as lie on planes of different levels; that is provided it be not required at the same time for the latter purpose

"Whenever it happens that the upper floor does not extend over the whole of a lower one, this circumstance also should be noted, by making those walls which are carried up higher than the others of a darker tint than the latter; while the plan of the upper floor should be made to show, not only all the projecting parts of the under one, but their roofs, lead-flats, skylights, chimneys, &c.

"It seldom happens, however, that plans, not intended for working drawings, are so well filled up as they ought to be. Those in books have, for the most part, very few details inserted in them, and are sometimes very ill defined, nothing further being represented than the walls and their apertures; hence they have a blank, naked appearance, and do not afford half the information that might be conveyed by drawings of this class. Neither is every part that is shown always so distinctly represented as is desirable; in many Italian collections of designs, for instance, the windows might be taken for mere recesses, owing to the solid part below the window, and not the window itself, being shown in the plan, and no distinction made between such parts of the walls and those where no aperture occurs; so that, were the same mode adhered to where the window recesses do not descend to the floor, the room would appear to have no windows at all, none being described in the plan. Some distinction should, perhaps, be made between windows which actually reach down to the floor, and those which are raised so far above it as to leave a parapet beneath them. Accordingly, these latter should be faintly tinted (in engravings as well as drawings), and windows raised so far above the floor that a per-

son cannot look out of them ought to be shaded several degrees darker. The same ought to be done in regard to small closets; for if a closet be merely in a recess in a wall, shut up with a door, it will not explain itself so well as it ought to do, but convey the idea of there being a recess open to the room; but, of course, the tint employed for this purpose should be still fainter than that made use of to show any window or opening in the upper part of a wall; nor should it be at all deeper than is requisite to define that such recess is not included within the actual limits of the room.

"Sometimes it might be useful to have flap plans, showing, as in a kind of model, all the floors of the building in their respective situations. The plan of each floor being drawn on Bristol board, and neatly cut out; upon another piece of the same material, an orthography of one of the external walls, which may be either an inner or outer elevation, is drawn; and to this the several

flaps or plans are to be affixed, according to the respective floor lines or heights, by means of narrow strips of linen, which will serve as a hinge, and allow the flaps to fold freely; so that the whole model, if it may so be termed, will lie perfectly flat, and may be kept in a portfolio. Or else, two or more projecting tongues may be left, in cutting out each plan, and corresponding slits be made to receive them in the upright part, so that all the pieces would be separate, and lie flat one upon another, and could be put together when required. Should this latter mode be preferred, there might then be two uprights or external walls, into both of which the floors would be inserted; and thus the whole might be rendered capable of standing firmly, without being supported by the hand while examined. Such flap models would be of limited application, because they would be suited only to rectangular plans; and, even in these, difficulties would frequently occur that would require some management."

ARCHITECTURAL LIBRARIES.

The following item, which we find in the columns of the *Evening Standard* of New Bedford, Mass., is really so truthful, as applied to many of our public libraries throughout the land, that we cannot help giving it, *verbum verbo*:

"It is proposed to erect a new building for the Free Public Library in Boston. The present building is a comparatively new one, and it would seem as though the science of architecture might have advanced sufficiently at this day that a suitable structure for such a purpose could be erected. Yet the Boston library building is pronounced very ill adapted for its purposes. It is in a contracted space, and in the interior, everything, says the *Boston Traveler*, has been sacrificed to a grand show room, while the alcoves are dark and difficult of access, and impose a great

deal of labor on the librarians. The same may be said of other library buildings. Convenience for practical use is sacrificed to what is considered architectural effect. The public admire a broad staircase, a large and lofty hall, massive columns with plaster capitals, a heavy entablature, while the librarian groans over the waste of room, the want of light, the ill-adapted arrangements which increase his labor and try his patience. If architects would consult the actual wants of those who have to administer the affairs of a large library, instead of their desire to make an idle show, these buildings would be much better adapted to their purposes. Perhaps, in Boston, where they have an unlimited amount of money, after three or four trials, they will get an approach to a model library building."

CORRESPONDENCE.

It must be distinctly understood that we do not hold ourselves accountable for the opinions of correspondents.

MR. EDITOR:—Will you favor me with an opinion? I am about to lay down concrete for a foundation in soft soil. I wish to know if common lime will answer, and how it is best to treat the mixture—whether to throw it down from a height or to ram it when laid?—L. S.

Answer.—In soft soil or damp situations it is better to use cement, instead of common lime, and lay on the concrete in courses of two or three inches in thickness. It used to be the practice to give a fall of seven yards to the concrete in locating it; but some prefer ramming. There is, however, an opinion now becoming prevalent that it is better to avoid both these modes of treatment, and let the concrete set undisturbed, as the effect of collision, either by a fall or by ramming, dislodges the binding material in many parts, and therefore renders the mass friable.

EDITOR REVIEW.—May I through the medium of your useful pages call the attention of those concerned in the capacious “rinks” which have been erected in our chief cities, recently, for skating purposes, and are now used for velocipedal exercising, to the fact that there is a very serious want of public baths throughout the Union. There are too many of the small private and objectionable sort, but of capacious swimming baths there is a very great want. Now, as our municipalities are not likely ever to confer such a boon on the sweltering tax-payers, however hot and uncomfortable the approaching mid-summer may be, it appears to me to be a most desirable speculation for those proprietors of the “rinks” in question.

What splendid swimming basins could be excavated in those areas,—and lined and floored with hydraulic cement,

how perfectly water-tight they could be made; and how clear the water would become, from the influence of the lime. Added to this would be the fact that in winter time Jack Frost would contract to transform the fluid into glassy ice, and restore to the skaters their borrowed domain.

The expense to be incurred in the construction of dressing-rooms, or boxes, would not be very serious, and these might be made movable, or so put together as to be easily taken apart in a comparatively short time.

Your publication of these hints may have the desired effect of drawing attention to this, what I consider, paying speculation, and confer happiness on all who have consideration for the sanitary condition of our cities and the cooling influences of the blissful BATH.

West Philadelphia.

R. M. G.

We fully agree with the writer as to the necessity for public baths, and trust that even SPECULATION may be aroused to a work which *humanity ought to attend to.*

SIR:—I am erecting a house on a confined lot, and am obliged to build on the boundary line at either side. I have a very neat design for a cornice, and would wish to execute it complete; but, as it returns at each end, I don't know whether I can do so or not. Both the flank buildings are below the line of my intended cornice. Will you please advise me in the difficulty? A BUILDER.

Answer.—The projections of the returns of the cornice here spoken of would be a trespass on the neighboring lots. We would recommend our correspondent to cut off his cornice at each end, by the introduction of consoles.

QUERIES AND RESPONSES.

INQUIRER, Rushville, Indiana.—The term **PORCH** is derived from the French *porche*, and means in architecture a gate entrance or hall doorway. **PORTICO** is from the Italian *portico*, and has in architecture a loftier signification, implying the presence of columns, which the other does not. The word **PIAZZA** is Italian, and means an enclosed square, with arched walks around it; it is used also in the sense of a raised walk around a dwelling, either covered by arches or simply balustraded. **VERANDAH** is from the Portuguese word *varanda*, and is used in architecture to denote a light, open gallery in front of a dwelling, covered by a sloping roof of fanciful construction. The verandah is really a feature of the Oriental style, although frequently used in connection with Venetian, Italian, French, and even the Domestic Gothic styles, in this country and in England.

You ask, What is water-lime? It is a lime which resists the action of water, and grows hard under its influence. In this it differs from slake or common lime, which lets off its caloric or latent heat to admit the water, and falling to pieces under its influence becomes reduced to powder.

In the Western States water-lime is known as "cement"—sometimes "hydraulic cement." But it is the hydraulic or water-lime which, with water, makes the cement. Therefore the name "lime" is more correct as applied to the dry powder in barrels sold for building purposes.

EVA.—Passages around scaffoldings of new buildings ought to be made more reliable than is generally the case.

BALTIMORE.—It is our intention to pay special attention, in the next volume of the **REVIEW**, to the wants of the working-class. For that purpose we have laid out a course to be followed which will, we doubt not, give satisfaction.

PAPIER MACHÉ.—This manufacture is not new, and it is a decided proof of its durability that ceilings are now in existence in many parts of Europe which were constructed over two centuries ago, and are yet in perfectly sound condition. This material, from its extreme lightness, is most desirable in ceilings, cornices, and centre-pieces; it is capable of receiving the sharpest and most elaborate impressions, and in this is fully equal to plaster, with the superiority of being so much less heavy than the latter. Ornamental work in *papier maché* may be glued on, and is often secured with screws. The use of this exquisite material enables the architect to indulge in most exuberant fancies of ornamentation, colored and gilded. The rapidity and cleanliness with which such work can be put up give it a very great advantage over stucco plaster.

JOINER, New Haven.—Yes, sliding-doors are coming generally into use. Single doors are seldom made on the sliding principle, but we know of some instances where such have been introduced in parlors and drawing-rooms. There is no good reason for not using them for single doors when we consider the fact that they do not hide furniture, and are not in the way as hinged-doors are. There are many instances in which single sliding-doors would offer great advantages in the laying out of plans, and as to their expense the comfort secured would amply cover the difference between them and hinged-doors.

DRAUGHTSMAN.—Drawing-paper is seldom secured with *bottle wax*. We have seen that mode used in some offices, but the cleaning of the board when the paper is removed leaves seams and ruts. Paste, glue, or gum answer very well for the purpose.

ANGLO.—The London **ARCHITECT** has not yet made its appearance on our table.

STUDENT.—Certainly. Every line in Nature is a line of beauty. It may be irregular or regular, curved, or angular, it is nevertheless beautiful, if it is natural. The human figure, in its perfection, is a most fitting study for the student of Architecture, the acquirement of a knowledge of it will always afford suggestions that will greatly assist in the development of grace and dignity in his designs.

ENQUIRER.—Mr. MULLET, the Architect of the Construction Bureau at Washington, formerly lived in Cincinnati.

CIVIS.—We quite agree with our correspondent, that gutters under the side-walks of our streets would be a very great blessing, as saving our fair friends from wading through constantly recurring torrents, from spouts, on rainy days. The deluging of brick side-walks, by the lavatory process, so much in vogue in Philadelphia and Amsterdam, is sufficiently suggestive of wet feet, without the rush of many waters, through which the trembling pedestrian has to plough, in the vain hope of dry land somewhere.

TERRA COTTA.—It is possible to make the front of a wall with terra cotta tiles, and also the inside, and fill in the heart of the wall with concrete. But the tiles must be moulded expressly for that purpose, having a flange above and below,

sufficiently long to form a good key. Something of this sort is now in practice in England. For inside facing it would not be so uniform as plastering.

SYLLA.—Your ideas on ventilation are neither novel nor correct.

NOTE.—In answer to several enquiries respecting the BRONZE DOOR KNOBS described at page 689, in the preceding number of the REVIEW, we would state that all further information can be had by addressing, J. B. SHANNON, 1009 Market street, Philadelphia, the manufacturer of these admirable pieces of artistic door furniture.

S.—Study it.

EARTH CLOSETS are beginning to attract attention. We have no doubt of their utility for country use, but we cannot see much advantage to be gained by introducing them in cities.

The water-closet is no doubt open to the disadvantages of being subject to the action of frost, and also liable to go out of order. But, apart from the power of deodorization, the earth-closet is less satisfactory than the water-closet, owing in part to the much greater trouble attendant on it.

This trouble may not be greater than that of the removal of ashes it is true. But *that* is a trouble and a constant one.

X.—Apply to our Publishers.

PERIODICALS.

THE WESTERN MONTHLY, for May, comes to us from its publishers, Reed, Brown & Co., replete with pleasant reading matter and instruction. This month's illustration is an excellent portrait on steel of Hon. Richard J. Oglesby, Governor of Illinois, accompanied by a well written biographic sketch. His is one of those lives we all delight to consider. Born of poor parents, left an orphan at nine years old, we find him struggling with disadvantages, but emerging at last and becoming one of the trio of self-made statesmen, LINCOLN, YATES and OGLESBY, all of the Great West. The article on American Education is well worthy of attention. The sketch of WILLIAM EWART GLADSTONE, the present Prime Minister of England, will amply repay perusal. And the paper on Utah is interesting in the extreme.

Altogether the WESTERN MONTHLY improves upon itself and is very creditable to its publishers, whose deserved success we trust will be soon and certain.

LES PROMENADES DE LA VILLE DE PARIS.—We have been favored with specimen sheets of this fine work, containing several exquisite wood engravings of the gems of the Bois de Boulogne. The work is in the folio form and will be complete in two volumes, to be issued in thirty parts, splendidly illustrated. We have already alluded to the advent of this splendid work of art in this month's REVIEW, and will duly notice it in full when it comes to hand.

THE PROBE. By JOSEPH PARRISH, M. D.—The second number of this useful and deeply interesting quarterly has just been issued from the Sanitarium at Media, in this State. There are few publications which in so small a compass contain such salutary lessons to our race as are to be found in the pages of this humane friend of the forlorn inebriate. Here is to be found not alone a diagnosis of the fearful malady, but directions for reform and an assurance of cure.



